Title Community Awareness in Managing Pre-Eclampsia in Baucid State, Northeastern Nigeria: A Cross-Sectional Study

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ABSTRACT

Introduction

Pre-eclampsia has been pin-pointed as one of the leading causes of maternal mortality in Nigeria especially in rural areas, yet very little has been done to provide effective measures in mitigating its impact on the public. This study assessed the level of awareness of pregnant women and health workers in managing pre-eclampsia in a community in Bauchi state, Nigeria.

Methods

A descriptive cross-sectional study was undertaken using self administered questionnaires, semi-structured questionnaire based interviews and field observation. 129 participants consisting of 103 women and 26 health workers were utilised. Information was obtained on the knowledge of symptoms of pre-eclampsia, use of antenatal care services, preferred information z, assessment of healthcare services and need for more health information. Two sets of Close-ended questionnaires were utilised. Data obtained was analysed using MS Excel and SPSS version 12 and descriptive indices obtained.

Results

In this study, it was observed that a large fraction of women did not know about pre-eclampsia or its symptoms, denoting poor levels of awareness of this health condition. The use and content of antenatal care services was demeaning. Clinical knowledge was also lacking among health workers, especially the healthcare assistants who make up a large fraction of the health force in Nigeria. Such pitfalls need to be addressed effectively.

Conclusion

The need for improved routine training of healthcare workers especially healthcare assistants is pertinent if they are to effectively manage this health condition, and educate the general public of its dangers. Community mobilisation and awareness must be included in intervention strategies to properly inform the public, and curtail existent communal beliefs about pregnancy. Recommendations and strategies promoting maternal health must take note of the harmful effects of pre-eclampsia amongst Nigerian women.

DEDICATION

This study is dedicated to the memory of my late mother, MRS. PRISCILLA CHIMEBERE KANU. Your love forever remains in our hearts. God bless your soul. Amen

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With gratitude and special thanks:

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DECLARATION

This study was completely undertaken and written by Denis Kanu.

The author used his own words or images, and ideas.

After conducting this study, the author has formed the results from his work

This study was not copied from the scripts of other authors or candidates, and no unauthorised materials were used. No false information has been submitted.

Name: DENIS OTIS KANU
DATE: 6TH OCTOBER 2008.

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LIST OF ABBREVIATIONS

ANC - Antenatal care

CEMACH – Centre for Maternal and Child Health

COMPASS – Community Participation for social sustainability

CRR – Centre for Reproductive Rights

DFID- Department for International Development

HELLP - Haemolysis, elevated liver enzymes, low platelet count

IUGR – Intrauterine Growth Retardation

NPC – National Population Commission

NDHS – Nigerian Demographic Health Survey

NHREC – National Health Research Ethics Committee

SPSS – Statistical Package for Social Sciences

TBA – Traditional Birth Attendants

UAE – United Arab Emirates

UN – United Nations

UNDP - United Nations Development Program

WHO - World Health Organisation

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Pre eclampsia is a health condition notable during pregnancy, classically less than 4 weeks in rare cases, and usually affecting both the mother and baby. It has been known to be a progressive condition categorized primarily by hypertension, oedema and proteinuria. Its onset is usually after 20 weeks of gestation in middle to late pregnancy (Pre-eclampsia foundation, 2007). Pre eclampsia could lead to eclampsia if not properly managed. It is a prevailing maternal health issue in Nigeria, especially in the rural areas where access to basic medical facilities and information is deficient. Eclampsia, which is the end-stage of untreated pre-eclampsia can be understood as the development of convulsions and coma in a woman during pregnancy (antepartum) or up to 48 hours after delivery (post-partum) in patients showing signs and symptoms of pre-eclampsia (Engender health, 2007). Characteristic signs and symptoms of severe cases of pre-eclampsia include nausea, vomiting, sudden weight gain (>2pounds in a week), headaches (migraine-like frontal or occipital), swelling (oedema), epigastric pain (upper right quadrant) and vision defects (blurred, flashing lights sensation, aura). Such pre-eclamptic and eclamptic conditions typically occur in first time mothers (primigravidae), especially those in their teens. It is also notable in multigravidae women, especially when there is a change in paternity, and in multiple birth cases (JRMS, 2006).

Nigeria is a nation plagued with poor reproductive health indices, contributing significantly to the Global maternal mortality crisis, being the second country with the worst maternal mortality rate besides India (Raphael, 2008). Various studies have been carried out in the past on issues that have affected reproductive health within the nation, with more attention placed on HIV/ AIDS and malaria in pregnancy as the contributory factors for Nigeria's high

maternal morbidity and mortality ratios. This study looks at the issue of Pre-eclampsia, an insidious health condition in women, including first-time mothers. Majority of these deaths have been identified in the rural areas due to deprivation and health inequality, hence basic strategies which can mitigate maternal deaths due to pre-eclampsia need to be evaluated and further implemented.

1.1 BACKGROUND

Statistics have revealed that Pre-eclampsia is a main constituent of feto-maternal morbidity and mortality (WHO, 2005). Pre-eclampsia can best be described as a hypertensive disorder of pregnancy. It is usually characterised with oedema, proteinuria, and convulsion. Possible symptoms which may occur in such women may include headache, oedema, visual disturbance, nausea and epigastric pain. The diagnosis of pre-eclampsia is not based on precise symptoms but on the presence of hypertension in pregnancy (systolic/diastolic value of **>140 mm Hg/ >90 mm Hg**) usually from the second trimester of pregnancy (WombEcology, 2006). Pre-eclampsia, a condition that leads to eclampsia is a placental disorder which causes maternal and foetal syndromes (maternal-causing circulatory disturbances, and foetal-causing respiratory and nutritional deprivation); the disease is known to progress from a preclinical stage, through a symptomless clinical phase to a more severe crisis that leads to eclampsia amongst others (Redman et al, 2004). In most cases in Nigeria, the cure for pre-eclampsia is achieved by delivery whereby the diseased tissue (the placenta) is also removed. In addition to the use of blood pressure readings to detect for pre-eclampsia, the onset of pregnancy-induced proteinuria (urinary excretion **>0.3g/d**) is also employed as a diagnostic measure (WombEcology, 2006). Other possible signs that can be noted include abnormal fluid retention, excessive weight gain **(> 1kg/wk)**, ascites, drowsiness, confusion, decreased urinary output, hyperuricaemia, hypocalciuria, and increased blood concentrations of liver enzymes; they may reveal impending eclampsia in a pregnant patient.

The incidence of pre-eclampsia is more prevalent in first time mothers, known as the Primiparae. It is a known complication in 25-30% of all nulliparous women (JRMS, 2006). It is very important that all first time mothers undergo antenatal screening every fortnight after 24 weeks of gestation, to prevent a chance eclamptic crisis from occurring undetected. It is routine in most primary health centres in Nigeria that intervals between antenatal checks are every 4 weeks from 20 and 28 weeks gestation, and the danger of having pre-eclampsia

within such interval may be prominent especially among the primiparae (Redman et al, 2004). Health workers are obliged to ensure routine checks on the health status of pregnant women are done during antenatal visits. Systemic blood pressure should be noted, and a rise in diastolic pressure above 90mm/Hg of a pregnant woman within a 2-4hour interval should pinpoint the risks of pre-eclampsia. The urine of the pregnant patient should also be analysed for proteinuria when hypertension is noted; such urine should be a mid-stream specimen and dipsticks could be used. There could be other factors which could cause protein in urine and they must be ruled out to make a pre-eclampsia diagnosis; such include Urinary tract infection, kidney disease, heart failure or severe anaemia (WHO, 2006). A pregnant woman presenting with hypertension and proteinuria together should be considered pre-eclamptic and managed urgently.

When the signs of pre-eclampsia in pregnant women are not properly managed, the complications of eclampsia are imminent. While pre-eclampsia is characterized by hypertension and proteinuria, eclampsia is characterized by convulsions and possibly coma in pregnant or newly delivered women. Common causes of death in eclampsia may include inhalation of one's vomit or other secretions, pneumonia, pulmonary oedema, intracerebral haemorrhage or failure in one or more vital body organs (WHO, 2006). Any three of the following risk factors can pinpoint as risk factors for eclampsia in a patient; primigravidae, multiple pregnancies, obesity, polyhydramnios, diabetes, hydatiform mole and essential hypertension (WHO, 2006). The majority of the healthcare force in Nigeria, which is the country of interest in this study, is made up of nurses, midwives and healthcare assistants. They usually have limited or no knowledge about the condition of pre-eclampsia, its risk factors, signs and symptoms, the management and therapies utilised, the factors that lead to developing eclampsia, the stages of an eclamptic fit and the risks to mother/child, possible causes of death in the patient, clinical observation, management and treatment of the affected woman (WHO, 2003).

It is important that healthcare workers know that pregnancy-induced hypertension may progress from mild hypertension to a life-threatening condition i.e. from hypertension without Proteinuria or oedema, to mild pre-eclampsia, to severe pre-eclampsia, to eclampsia. Sometimes this progression can occur very suddenly with little or no warning (known as fulminating eclampsia), thus endangering the mother and unborn child (Redman, 2004). This can be fatal amongst women in Nigeria, who initially are not registered for ante-natal services,

let alone have their vitals carefully monitored. The health workers should also have considerable knowledge on various clinical signs which differentiate when a pregnant mother is suffering from mild or severe pre-eclampsia, so as to ascertain the best form of action to take towards tackling the disease condition. The insidious form of pre-eclampsia is one of the reasons careful attention must be taken to address it. The most essential and probably effective remedy for this disease is regular ante-natal monitoring, as well as careful follow-up by the health workers of pregnant women with mild pre-eclampsia to ensure early diagnosis and hence, treatment of severe eclampsia. If a woman presents with clinical signs and symptoms of severe eclampsia (as noted in Appendix 8), urgent treatment must be initiated to prevent its onset which is fatal.

Nigeria, having a very high maternal mortality rate, suffers considerably from the effects of pre-eclampsia and eclampsia. There have been notable barriers to effectively managing pre-eclamptic and eclamptic conditions, as well as other maternal health issues, in this great nation. Worldwide, the standard measure used for treating and managing pre-eclamptic states in pregnant women is utilizing a drug called **Magnesium Sulphate**. The eclampsia trial collaborative group in 1995 confirmed the effectiveness of magnesium sulphate in managing eclamptic seizures in pregnant women, which has led to a significant reduction in maternal and perinatal complications and/or deaths in most developed nations (Eclampsia Trial Group, 1995). In Nigeria, magnesium sulphate is less variably utilized. There is no national guideline mandating the use of this drug in managing eclamptic patients (Engender Health, 2007). Worldwide, only about 50% of the countries (excluding Nigeria) have included the drug Magnesium sulphate in the Health ministry's essential drug list. The drug of choice in Nigeria is Diazepam for controlling the seizures, and anti-hypertensives to manage high blood pressure (WHO, 2006). The stages of an eclamptic fit are clearly stated in Table 2, and it would be beneficial if health workers have sound understanding of this important information when dealing with pregnant women (See Table 2).

Majority of the maternal deaths occur during delivery and post-partum, hence strategic commitments to tackle this limitation must include emergency obstetric care, increased use of skilled birth attendants, training of traditional birth attendants especially on the need for prompt referrals during complications, increased antenatal visits and postpartum care, improved health promotion and advocacy issues, and standard transportation to medical facilities when complications arise (POLICY PROJECT, 2003). Such strategy should

embrace all areas of the nation- rural and urban; and all the people regardless of socio-economic status if a notable change in the health indices is anticipated. Owing to the fact that Nigeria has a decentralised governing and decision-making mechanism (shared between the three tiers of government- local, state and federal), it is important that the Partnership for maternal, newborn and child health is created to centralise all stakeholders' efforts in a concerted manner to achieve the objective of reducing maternal mortality on a national scale (WHO, 2008c).

A recent research carried out by the Centre for reproductive rights (CRR) located in New York identified deep-seated problems undermining the promotion of maternal health in Nigeria; they included the lack of political will by the Government on the issue of developing and implementing maternal health policies as well as providing adequate funds to finance such policies; weak infrastructure; non payment of health workers; widespread corruption amongst relevant stakeholders in health service delivery and the Government. On the grass root level, issues arising from patient user fees for accessing healthcare services, availability and proximity of maternal healthcare centres, lack of adequate health information, and the socio-economic status of majority of the women in Nigeria amongst others are contributory to the poor health indices amongst Nigerian women (Raphael, 2008).

Pregnant mothers and women are in many instances responsible for their transportation to the medical centres even during an emergency, purchase of their medical and surgical supplies, up to their infant's delivery fees. The Nigerian Demographic health survey has identified inequalities in the promotion of maternal health services across the geo-political zones of the nation, hence the increased disparity in recorded health indices (NDHS, 2004). Findings from this study could be implemented in prospective maternal and child health development programmes at grass root and national levels by policy makers and International organisations.

1.2 RATIONALE FOR STUDY

Nigeria has the second highest global maternal mortality after India. Approximately 2% of the world's population are resident in Nigeria, and this nation is responsible for 10% of all global maternal deaths with pre-eclampsia contributing about 12 % of these deaths amongst Nigerian women (Raphael, 2008). The alarming rate of maternal, infant and child mortality

figures in Nigeria reveals a lack-lustre desire by the relevant stakeholders to achieve the set millennium goals by 2015 and beyond (See Appendix 5). While approximately 54,000 women die annually from pregnancy-related complications, about 1,080,000 to 1,620,000 women and girls suffer from disabilities (Ruptured uterus, Pelvic Inflammatory Disease, Obstetric fistula etc) due to complications in pregnancy and childbirth annually (POLICY PROJECT, 2003). Direct medical causes of maternal mortality in the study population include Haemorrhage, Infection, unsafe abortion, Pre-eclampsia and hypertensive disorders in pregnancy and obstructed labour amongst others (POLICY PROJECT, 2003).

This study seeks to identify the level of awareness of women in rural communities about the classic signs and symptoms of pre-eclampsia and eclampsia; the role of healthcare staff in managing pre-eclampsia and eclamptic emergencies. It seeks to evaluate the perception of women regarding the importance of antenatal care, source of antenatal information and care, level of support from health staff, and their views on eclampsia. These factors all provide a rationale for carrying out this study on evaluating the importance of promoting the knowledge and awareness of signs and symptoms, complications from and management of pre-eclampsia amongst women and healthcare workers.

Figure 1: *A happy mother and child, a result of strict compliance to antenatal care visits as well as post-natal care; essential tools to reducing maternal, infant and child mortality in the developing world*

Source: WHO (2006c) Making a difference in countries.

1.3 STUDY AIM & OBJECTIVES

1.3.1 AIM

The purpose of this study is to assess the knowledge and awareness of the clinical presentation of pre-eclampsia by pregnant mothers and healthcare workers in Ganjuwa community, Bauchi-state Nigeria.

1.3.2 SPECIFIC OBJECTIVES

1) To determine the level of knowledge and awareness of the women in the community about pre-eclampsia and the use of obstetric services.
2) To determine the level of knowledge of the health workers in the community as regards pre-eclampsia, its symptoms and clinical presentation, diagnosis, frequency of occurrence, management and methods of testing.
3) To identify barriers at grass-root levels regarding the use of antenatal services in the community.
4) To determine the preferable health information seeking patterns of women in the community on the subject of pre-eclampsia, and assess effectiveness of healthcare education/ advocacy in reducing the incidence of eclamptic cases amongst women.
5) To note the standard of obstetric services in the community and the efficiency of referral systems for handling obstetric emergencies.

1.4 SUMMARY

The study is being conducted to obtain relevant information about the knowledge and awareness of pre-eclampsia amongst women and health workers residing in a rural area of North-East Nigeria, and to identify ways of improving health-seeking information as well as the content of the information given by the health workers to these women. Also, to evaluate the efficacy of existing antenatal services with reference to pre-eclampsia, identify stronger options for future health advocacy campaigns and increased antenatal attendance as a salient option in curbing incidences of pre-eclampsia in Nigeria.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

The review of literature is important aspect of research work, providing the researcher with background knowledge of the proposed study, looking at existing research literature and noting lapses which could be evaluated by future research work. This chapter looks at the methodology used and reviews literature based on selected themes.

2.1 LITERATURE REVIEW METHODOLOGY

Prior to commencing any research study, it is essential that in-depth analyses of extensive research databases are carried out by the researcher and his team (Fink, 2006). This provides a framework for the study, and guides the researcher on gaps in previous research work carried out on the subject of interest i.e. supporting previous works or providing a fresh insight on the subject matter. The evidence utilized for this research (based on the study objectives) as regards reviewing standard literature was obtained from articles/journal online databases (MEDLINE, EMBASE, PubMedCentral, Lancet, CINAHL, JSTOR, BioMedCentral etc), government reports (the Nigerian demographic health survey 2003), National bureau of statistics (census reports), online data from the World health Organization, COMPASS, POLICY PROJECT, DFID, UN and UNDP amongst others. These provided a justification for this study to be carried out, as the world more than ever, needs practicable strategies and policies to reduce the alarming rate of maternal mortality in developing nations.

The criteria for inclusion would be based on ideas including "pre-eclampsia and antenatal care services". Various factors like sepsis, unsafe abortion, haemorrhage and obstructed labour in addition to eclampsia can increase the rate of maternal mortality. Hence all these other causative factors would be excluded from the literature review and more emphasis would be laid on the issue of **pre-eclampsia**. Keywords used for the search included '**seizures in pregnancy, model antenatal care, toxicaemia in pregnancy, pre-eclampsia, hypertension in pregnancy, antenatal care services, maternal health services in Nigeria, health education, management** and **advocacy for pre-eclampsia in Nigeria**' amongst others. Studies which exceeded 12 years were excluded from the literature search as they may be considered outdated; Primary literature searched which were beyond the inclusion criteria of 12 years were unique ones with no recent replication, and are of historical significance to the subject matter studied (citing from Ozumbia, Ekwempu, Saftlas, Moller, Douglas, Newman, Eddly, Lopez-Llera). The themes used in the literature review of this study includes **aetiology and burden of pre-eclampsia, pre-eclampsia and its effects on the Nigerian mother and child, issues surrounding maternal mortality in Nigeria, possible treatments aimed at tackling pre-eclampsia in Nigeria, antenatal care services** and **the effects of antenatal care on the health of Nigerian women,** as well as **the limitations to the use of reproductive health services in Nigeria**. The themes offer a concise perception of the subject matter, providing a pathway which this research would be conducted so as to achieve the set objectives.

2.2 LITERATURE REVIEW

According to the Pre eclampsia foundation (2007), Pre eclampsia occurs during and after pregnancy, usually less than 4 weeks in rare cases affecting both the mother and baby. It has been known to be a rapidly progressive condition categorized by hypertension and proteinuria with an onset after 20 weeks of gestation in middle to late pregnancy. It progresses over time to eclampsia. Risk factors for pre-eclampsia include nulliparity and mothers older than 35years, body mass index of 35 or more (APEC, 2005), poor prenatal care, familial history of pre-eclampsia/eclampsia, and pre-existing hypertensive or renal disorder (Fugate, 2005). Sibai (2005) identified Eclampsia, an end-result of pre-eclampsia, as the initiation of convulsions and/or coma of unknown aetiology during pregnancy (antepartum) or up to 48 hours after delivery (post-partum) in patients showing signs and symptoms of pre-eclampsia. Its onset can either be antepartum, intrapartum or postpartum with a range of 38-53%, 18-

36% or 11-44% respectively for each class (Sibai, 2005). Various studies noted that its incidence is rare in most developed countries with ranges from 1 in 2000 to 1 in 3448 (Saftlas, 1990; Douglas, 1994; Martel et al, 2005). Eclamptic incidence in developing nations like Nigeria ranges between 9 in 1000 to 14 in 1000 pregnant women (WHO, 2006). The World Health Organization (2006) pointed that, cases of Eclampsia accounts for about 12% of all maternal deaths globally. In Nigeria which has a maternal mortality rate of 800 per 100,000 live births, the issue of pre-eclampsia is a grave one which requires stronger focus, health advocacy and timely intervention.

2.2.1 AETIOLOGY AND BURDEN OF PRE-ECLAMPSIA

The exact mechanism that is causative of pre-eclampsia remains elusive as many scientists have come up with varying theories as to the aetiology and management of pre-eclampsia in affected women. Salas in a 1999 study observed that some obstetricians believe that the convulsions which occur during pregnancy are based on cerebral congestions, due to the compression of the abdominal organs by the large uterus, thus diverting blood flow to the brain and leading to eclamptic convulsions. Others believe pre-eclampsia is due to an absolute or relative placental ischemia (inadequate supply of blood to the placenta) followed by diffuse endothelial cell activation causing clinical features of the disease condition (Salas, 1999). Usually, therapy for pre-eclampsia is designed to curtail the progression of this disorder to eclamptic states characterized by seizures, residual hypertension, and renal failure. The end-result of such therapy is promoting foetal and maternal survival. In most pre-eclamptic cases in Nigeria, the only way out is by delivering the baby so as to preserve the mother's life primarily. Scientists at the University of Leeds recently expressed that there is no early predictor of the health condition, and it can be diagnosed only when the clinical signs appear (Leeds, 2008).

According to Brabin (2004), the placenta has been linked to be essential for the pathogenesis of Pre-eclampsia. Pre-eclampsia is caused by a defect in the placenta of pregnant women. Okere (2008) notes that the placenta is part of the womb that joins the mother with her baby, supplying the baby with essential nutrients from the mother's blood circulation. The hypothesis that pre-eclampsia might be caused by the placenta arose after the observation that clinical symptoms of pre-eclampsia usually resolve soon after delivery. Ernest Page in 1948 argued that the placenta did not have to be completely damaged to cause pre-eclampsia, but

simply cut off or limited in maternal blood flow; this argument still holds till date (Redman et al, 1992). It was further documented by Salas (1999) that the placenta was the etiologic component for pre-eclampsia when it occurred in pregnancies associated with hydatidiform mole, in the absence of a foetus. More than a hundred years ago, scientists postulated that the presence of a circulating toxin probably of foetal origin was responsible for pre-eclampsia and eclamptic convulsions; hence this disease condition was coined as **'Toxaemia of Pregnancy'** ever since (Salas, 1999). This circulating toxin was understood to be above maternal capacity for excretion and thought to accumulate in the placenta, causing clinical complications.

Retrospective studies by Redman et al (1992) explained that scientists then put forward such potential toxins as water, bacterial toxins, foetal waste products, toxins released by the placenta, substances normally excreted when a woman is menstruating but now retained due to pregnancy, toxins released by the foetus itself and/ or maternal waste products retained within the body due to malfunction in any of the various excretory organs (Redman et al, 1992). Despite the assumption that pre-eclampsia could be caused by Toxin(s), no single toxin has been isolated and identified yet. Many experts till date still believe that maternal illnesses observed in this condition are directly caused by a substance tagged 'Factor X'; this substance is thus released into the mother's bloodstream by her deficient placenta (Redman et al, 1992). Redman et al (1992) also noted from a different point of view, that other set of scientists in the nineteenth century argued that eclampsia was a type of **uraemia** which is the end-stage of nephritis. They pointed that excess amounts of waste products including urea which are normally excreted renally had accumulated in the bloodstream, causing toxic effects on the mother. As of present, it is well recognized that pre-eclampsia is not a kidney disease, but women with pre-existing kidney diseases are prone to pre-eclampsia. Salas (1999) further affirmed that Proteinuria typically associated with pre-eclampsia, is one of its many side-effects and not its cause (Salas, 1999).

A report by Robilland in 2003 indicates that Pre-eclampsia remains a major cause of maternal and foetal morbidity and mortality around parts of the world and the developing nations are most hit. It affects 150million pregnancies annually worldwide with marked increased prevalence in first time pregnancies (Robilland, 2003). According to Szymanska (2003), Pre-eclampsia is a major cause of premature delivery in women globally, and developing nations like Nigeria are worst hit. Nilsson et al further expressed that pre-eclampsia causes pre-term labour in about 15% of pregnant women; the mortality of neonates is estimated to be five

times more if the mother has pre-eclampsia (Nilsson et al, 2004). Ibeh et al (2006) also expressed that eclampsia follows suit in about 5% of pre-eclamptic cases if they are not properly managed, leading to convulsions and fits in the woman (Ibeh et al, 2006). Martell et al (2005) identified that eclampsia complicates between 1 in 100-1700 pregnancies in the developing nations like Nigeria to 1 in 2000 pregnancies in the developed world. Eclampsia accounts for 50,000 maternal deaths annually and is a serious life-threatening condition which must be tackled with caution. Over 500,000 women die annually from pregnancy related causes and approximately 99% of such deaths occur in developing nations. This health concern was further supported by a study by Verwoerd et al in 2002 which states that in nations like the United Kingdom with developed infrastructure, 1 in 50 of the women who present with eclampsia dies (Verwoerd et al, 2002).

Pre-eclampsia is the second direct cause of maternal morbidity and mortality globally. It has been stated by the World Health Organisation (WHO) that it accounts for 63,000 deaths annually, and there were 4,152,000 estimated cases of pre-eclampsia and eclampsia in 2002 (WHO, 2005). Lozano and colleagues identified pre-eclampsia as the leading cause of maternal deaths in Mexico (Lozano et al, 2005). A similar report by scientists at the University of Leeds expressed that Pre-eclampsia affects about 1 in 10 women and accounts for up to 15% of all premature deliveries in the United Kingdom (Leeds, 2008). Globally, Nigeria is the second largest contributor to maternal mortality. A 2008 report by Okere stressed that approximately **52,900** women **die annually** due to pregnancy-related causes in the country (Okere, 2008). This is extremely appalling for an oil-rich nation which is the 8th largest supplier of global crude oil supplies, and the largest supplier in Sub-Saharan Africa to the United States (Kiernan, 2007). This is further supported by the review conducted by Engender Health pointing out that the snowballing risk for pre-eclampsia in women is higher for would be mothers in developing countries like Nigeria than those in developed nations in the ratio **seven to one** (Engender Health, 2007). Women in Nigeria who present with pre-eclampsia are **thrice more likely** to develop eclampsia than their peers in developed nations like the UK, Sweden and USA. If they develop eclampsia, such women are **14 times** more likely to die from eclampsia than those in developed nations (Engender Health, 2007). The burden of this health problem is inexcusable and cost-effective strategies and intervention which would provide a panacea to this problem must be efficiently implemented accordingly.

2.2.2 PRE-ECLAMPSIA AND ITS EFFECTS ON THE NIGERIAN MOTHER AND CHILD

Most pregnant women in Nigeria do not know the level of harm pre-eclampsia and eclampsia can have on them. Even when they do, many are unaware of its effects on their unborn child, thus expressing their negligence by not attending regular ante-natal services. They are usually adamant to accepting undemanding public health measures towards ensuring uneventful pregnancies and delivery, but if the effects of such action on their unborn children can be relayed to them, more attention can be drawn towards preventive measures in mitigating the effects of pre-eclampsia on pregnant women. The World Health Organisation in a 2006 Reproductive health report (WHO, 2006) states that the consequential effects of eclampsia on the mother may include:

- HELLP syndrome (Haemolysis, elevated liver enzymes, low platelet count)
- Oedema, haemorrhage or thrombosis of the brain
- Acute kidney failure amongst other complications
- Cardiac failure
- Hepatic necrosis of the liver
- Coagulopathy (clotting failure)
- Convulsive injuries like fractures, deep bruises
- Respiratory asphyxia, or aspiration due to vomit
- Pulmonary oedema or broncho-pneumonia

The 2006 WHO report also noted that majority of maternal deaths due to eclampsia arise from intra-cerebral haemorrhage, respiratory complications and multiple organ failure (kidney, heart, and liver). These complications need to be effectively prevented or managed to avoid such deaths (WHO, 2006). Pre-eclampsia usually leads to harmful effects in the unborn baby. It is associated with reduction in maternal placental blood perfusion thus exposing the foetus to Hypoxia and Intrauterine growth retardation (IUGR); In severe instances, resulting in a stillborn baby due to early placental abruption and pre-term labour (WHO, 2006). Studies by Brabin et al in 2004 pointed out that pre-eclampsia also causes loss of placenta integrity, endothelial cell dysfunction, and it has been associated with low birth weights in babies (Brabin et al, 2004). Pre-eclampsia has been pinned as the leading cause of intrauterine growth retardation (IUGR) in developing nations (Brabin et al, 2004); it is more prominent than other causative factors like maternal nutrition at conception and during pregnancy, smoking, alcohol consumption etc (UN University, 2002). A similar study by Wrong Diagnosis Journal reported that anaemia, kidney failure, foetal congenital defects and

other maternal health conditions could also cause IUGR (Wrong Diagnosis, 2008). Looking at the complications which pre-eclampsia may have on mother and child long-term, in addition to the pitiable reproductive healthcare and emergency facilities in Nigeria, it is quite important these women are informed of the consequences of avoiding simple preventive measures which routine antenatal care visits offers them.

2.2.3 ISSUES SURROUNDING MATERNAL MORTALITY IN NIGERIA

Ujah in 2005 undertook a research to understudy the factors which contribute to the increasing levels of maternal mortality in Nigeria. A seventeen year review of all hospital records, between January 1, 1985 and December 31, 2001, of women who died during pregnancy and childbirth in Maternity centre of the Jos University teaching hospital Nigeria was carried out (Ujah, 2005). Results showed that there were 38,768 deliveries of which 267 maternal deaths occurred. This presented a maternal mortality rate of 740 per 100,000 deliveries. The results also interpreted that women within the age range of 15 and 40 were at greater risk. Also, the ratio was higher in women with higher multiple deliveries (multiparous patients). It was identified that women who never booked for antenatal services or were illiterate had higher cases of maternal mortality than those who attended such antenatal meetings. This study showed that major causes of maternal deaths included haemorrhage (34.6%), sepsis (28.3%), pre-eclampsia/ eclampsia (23.6%) and unsafe abortion (9.6%) (Ujah, 2005). This goes on to confirm that eclampsia is amongst the major causative factors for high maternal morbidity and mortality figures in Nigeria.

A similar study determining the incidence and causes of maternal deaths in a rural hospital setting was undertaken in 2007 by Igberase and Ebeigbe (Igberase et al, 2007). They reviewed hospital records of 115 consecutive maternal mortalities within a 10 year period (January 1994-December 2003) at a rural hospital in South-south Nigeria. During the period, 5153 deliveries occurred which resulted in 115 maternal deaths. The maternal ratio was placed at 2232 per 100,000 live births. Results showed that puerperal sepsis (33%), abortion complication (22.6%), pre-eclampsia/ eclampsia (17.4%) and prolonged obstructed labour (13.0%) were responsible for majority of the recorded deaths; thus revealing the level of involvement which pre-eclampsia plays in the increasing maternal mortality figures in Nigeria. The study once again draws light on the issue of patients with **unbooked status** (this means pregnant women who do not register for their antenatal services at the maternity ward,

or initially register and refuse to attend follow-up sessions), which increases the prospect of pregnancy-related complications. Igberase et al concluded that the percentage mortality for unbooked patients was 10 times that for booked patients (Igberase et al, 2007).

Other reasons have been pinpointed as causative factors for pre-eclampsia. A case control trial of 91 pre-eclamptic and 91 control women aged 20-35 years was conducted by Yousefi et al in 2005 to identify if there was a relationship between women with shorter co-habitation periods with their partners and the incidence of pre-eclampsia. Results showed that chances of first-time mothers developing pre-eclampsia increased when they had a shorter period of co-habitation (< 4months) with their partners or spouses (JMRS, 2006). They also evaluated the relationship between unprotected coitus and pre-eclampsia, showing that women using oral contraceptives had a lower rate of developing pre-eclampsia than women who used barrier methods or no oral contraceptives (JMRS, 2006). It has also been identified that the quality and content of the antenatal services offered has a direct implication on the incidences of pre-eclampsia. A study carried out by Urassa and colleagues in 2003 at 16 antenatal clinics in Rufiji district, Tanzania detected the low quality of screening and management of hypertension amongst the hospital sites (Urassa et al, 2003). They also noted that despite the high antenatal coverage of 97% in Tanzania, the maternal mortality figures were terribly high at 960/ 100,000 live births confirming that the quality of antenatal care can have contributory effects to mortality rates in developing nations (Urassa et al, 2003).

Studies by Sibai observed that clinicians usually make conclusions on the diagnosis of eclampsia in patients once they observe generalized oedema, proteinuria, hypertension, and consequent convulsions (Sibai, 2005). In some women, one or all of the symptoms may be absent thus making it difficult to diagnose. The standard of diagnosis for eclampsia though is the presence of hypertension. The hypertension can be of two forms: Severe (BP: >160mmHg systolic/>110 mmHg diastolic) or Mild (BP: 140-160mmHg systolic/90-110mmHg diastolic). This can be noted in between 30-60% of eclamptic cases (Matter and Sibai, 2000). A study by Sibai and Matter in 2000 noted that such forms of severe hypertension can be evident in patients who develop antepartum eclampsia (58%) and in patients presenting with eclampsia at 32 weeks of gestation or much earlier (17%), but it known to be absent in about 10% of women who develop eclampsia (Matter and Sibai, 2000). Another indicator for eclampsia is the dipstick for noting proteinuria. This study, conducted with 399 eclamptic women, observed significant proteinuria in 48% of them and this was

absent in about 14% of the women (Matter and Sibai, 2000). The values were > 3+ on the dipstick. Also noted in the study was the presence of abnormal weight gain of 2 pounds or more weekly especially in the third trimester of pregnancy which usually is the first sign before the onset of eclampsia in these women (Matter and Sibai, 2000). The study also revealed the absence of clinical oedema in 26% of the 399 women who were evaluated.

For a clinician to make accurate diagnosis of possible or prevailing pre-eclampsia in pregnant patients, he has to identify one or all of the above signs (hypertension, proteinuria, generalised oedema) in addition to complaints given by the patients. Such symptoms may include blurred vision, photophobia, persistent frontal or occipital headaches, epigastric or right upper-quadrant pain, and possibly an altered mental state. A retrospective study by Douglas and Redman on 325 women revealed that 59% of patients will complain of at least one of these symptoms (Douglas and Redman, 1994); Chames et al in a study on 89 women further supported this, noting one or more of these symptoms in 75% of the patients (Chames et al, 2002). The onset of 91% of eclamptic cases is at 28 weeks of gestation or beyond (Matter and Sibai, 2000). It has been observed in 1.5% of pregnant women that pre-eclampsia may occur before the 20th week of gestation or earlier. Newman and Eddly (1998) identified that such pre-eclampsia is associated with molar pregnancy or hydropic degeneration of the placenta with/without a concurrent foetus. The 2002 study by Chames et al identified another form of eclampsia notable in rural Nigeria called Post partum eclampsia which usually occurs within 48hours after delivery. Some cases of eclampsia have been reported more than 48hours after delivery. They usually occur less than 4 weeks after delivery and are classed as **late postpartum eclampsia**. The clinical signs and symptoms associated with pre-eclampsia along with convulsions are also noted in this class of eclamptic cases (Chames et al, 2002).

Previous studies by Lopez-Llera have revealed that after the autopsy of patients who die from eclampsia, cerebral pathology like oedema, infarction and haemorrhage had been observed (Lopez-Llera, 1992). Zeeman's group in a related study on cerebral infarction in eclamptic women further noted that cerebral oedema, usually of vasogenic state, was observed in 93-100% of the women under study (Zeeman et al, 2004). Sibai in 2005 also observed that most eclamptic patients usually display apparent neurological abnormalities like cortical blindness, motor deficitis and coma but they are not usually permanent (Sibai, 2005). Hypertensive encephalopathy is a central nervous system abnormality notably evident in eclamptic women. Malfunction of the normal cerebral blood flow auto-regulation occurs in these cases; hence

studies by Cunningham et al (2000) and Sibai (2005) confirmed that hypertensive encephalopathy can be a striking factor in the origin of eclamptic convulsions (Sibai, 2005; Cunningham, Twickler, 2000). The use of cerebral imaging (Magnetic Resonance Imaging, Computed axial Tomographic-CT scan) in detecting these abnormalities have been beneficial in diagnosing patients who have atypical presentation for eclampsia with an onset usually before 20 weeks of gestation or after 48 hours of delivery (Sibai, 2005). The issue is, in a developing country like Nigeria, access to these high technology detection equipment and services are out of reach for the average residents in the rural areas where the incidence of pre-eclampsia/eclampsia is high. Hence cheaper interventions are needed to at least help curtail these rising morbidity and mortality rates. Shennan in the British medical journal stated that prophylactic administration of low dose aspirin (75-81mg) can reduce the chances of a mother getting pre-eclampsia during pregnancy by 15% (Shennan, 2003). In conclusion, these cheap intervention measures can be included in the guideline for obstetric care of such low income women.

2.2.4 POSSIBLE TREATMENTS AIMED AT TACKLING PRE-ECLAMPSIA

Numerous researches have been conducted on the main cause of Pre-eclampsia, as this would be the key to finding a cure or an effective treatment regimen for it. The All Refer health journal in 2003 documented that theories linking Pre-eclampsia to genetic, nutritional, autoimmune factors and vascular causes have been pointed out but the exact cause has yet to be identified (AllRefer Health, 2003). The only known and practicable cure is delivery. In some cases, the delivery may be pre-term leading to the death of the baby. In a bid to prevent this as further noted by the AllRefer Health Journal in 2008, the disease may be managed by bed-resting the pregnant mother with careful monitoring of her blood pressure, urine protein levels and body weight until the baby is term for delivery (promoting survival outside the womb) (AllRefer health, 2008). Pregnancies between 24 and 28 weeks of gestation are coined the GRAY ZONE where proper monitoring and clinical management of the pregnant women are prime. Health workers usually manage the pre-eclamptic mother until after 36 weeks of pregnancy, ensuring proper foetal development and survival on delivery; in severe cases after 28 weeks of pregnancy, delivery can be opted to preserve life.

The AllRefer Health journal in 2008 revealed that, in pregnancies which are less than 24 weeks, delivery can be performed in emergencies but the possibility of a viable foetus is

minimal (AllRefer health, 2008). If such pregnancies are prolonged, especially in severe eclampsia, maternal complications occur and infant deaths have been observed in about 87% of cases. Labour could be induced when **any** of the following occurs: Diastolic blood pressure is above 100mmHg consistently over 24 hours, the patient presents with severe persistent headache, abdominal pain, failure of foetal growth as noted by the ultrasound, pulmonary oedema, HELLP syndrome, and eclampsia. It could also be induced if the liver function tests are abnormal or serum creatinine levels are high in the pregnant patient (AllRefer health, 2008). During the induction of labour and subsequent delivery, eclamptic seizures are controlled, as well as the blood pressure of the woman. It was also stated in The All Refer Health journal in 2003, that the decision to perform either vaginal delivery or caesarean section depends mainly on the state of consciousness of the mother and the level of tolerance of labour by the foetus (AllRefer Health, 2003).

Redman et al (1992) reported that in the past, various methods of treatments have been attempted on pre-eclamptic women. They have been blistered, purged, packed, anaesthetized, paralysed, placed under diuretics, sedated, punctured, lavaged, been dehydrated, and/or delivered forcibly. Surgical procedures like implantation of the ureters in the colon, post-partum curettage (scrapping the womb lining), and drainage of spinal fluid have been done in the past on women with pre-eclampsia (Redman et al, 1992). In parts of Nigeria, such women are even abandoned and neglected especially in rural areas where they are assumed to be possessed with an evil spirit. By mid nineteenth century, the main treatments of eclampsia were simply by bleeding and purging; bleeding due to the theory of toxaemia (as the aetiology of pre-eclampsia) and excessive blood flow to the brain, and purging due to the theory of uraemia (caused by excretory malfunction and excess metabolic products that stimulates pre-eclamptic side-effects). Redman el al also noted that over time, the process of heavy sedation and even forced delivery method involving the rupture of the membranes and stimulating contractions was introduced (Redman et al, 1992).

While caesarean section is commonly used as a treatment for pre-eclampsia in parts of the world including Nigeria, the use of injectable Magnesium sulphate is prominent in the US. Safer forms of induction using uterine stimulants prior to delivery have been well commended. Redman et al (1992) also documented that early deliveries of the foetus pose minimal risks to the mother, and aids in preserving their lives during pre-eclamptic episodes; the risks to the baby are based on their maturity at birth (Redman et al, 1992). Various

attempts have been made towards predicting the onset of pre-eclampsia in woman, as well as detecting those prone to developing the condition. The most recent as pointed out by Rizzo et al (2007) is the **uterine artery Doppler velocimeter** and the **3-D ultrasound placental volume calculator**. In summary, the most significant human effort in preventing the worst effects of pre-eclampsia in pregnant women was the extensive introduction of ante-natal care. The irony in Nigeria is the lack of presence of these ante-natal services as well as the zeal to motivate pregnant women to attend these clinics. This has marred the provision of safe and effectie maternal and child healthcare in the nation, thus the high mortality figures observed.

2.2.5 ANTENATAL CARE SERVICES

Antenatal care simply put means, routine screening of pregnant women for health and socioeconomic conditions that are most likely to augment the possibility of particular undesirable pregnancy outcomes. The World Health Organisation notes that this screening process assists in providing effective medical interventions, as well as educating the pregnant women towards planning for safe birth and handling possible emergencies during pregnancy (WHOSIS, 2008). It is important that all women, regardless of their socioeconomic class should have access to skilled care and services during pregnancy and at delivery. This provides for detection, care and management of any pregnancy-related complications. The World Health Organisation also defined skilled birth attendants as professionally accredited health staffs who are duly trained to manage normal uncomplicated pregnancies, the birth of the child as well as the immediate postnatal period (WHOSIS, 2008). They also identify, manage and when the pregnancy is complicated, refer such patients to the appropriate healthcare setting. A skilled birth attendant may include the midwife, medical doctor or nurse.

Most antenatal care services offered in the healthcare settings usually comprise of the prevention, detection and treatment of malaria (which is an epidemic in the nation); prevention and treatment of anaemia (as most Nigerian women are anaemic due to poverty/malnutrition especially during pregnancy); detection and care of HIV and other sexually transmitted infections; tetanus toxoid immunization. The issue of pre-eclampsia is a latent one which most pregnant women especially the first time mothers have no idea of until they become victims themselves. The apparent reason for this is the complexity of the health condition, making it difficult for most healthcare workers in Nigeria to discuss about it with their patients. In many antenatal care services in Nigeria, the women are mainly educated on

the positive side of maternity and very little is mentioned of possible complications during pregnancy. Hence after they make their initial antenatal care visits, they are less inclined to make further visits as they believe there is nothing to worry about. They are usually caught off-guard when any complication subsequently arises. Policy Project in 2003 reported that the average age at first marriage in Nigeria is 17 years, while about 54% of the Nigerian female population give birth before the age of 20 years (POLICY PROJECT, 2003); hence the importance of routine antenatal visits should not be underestimated if pregnant women are to be effectively cared for (thus avoiding maternal complications and emergencies).

The World Health Organisation (2006) stated that in 2005 alone, there were 5,377,000 recorded births per year in Nigeria with a crude birth rate of 42/1000 and death rate of 19.4/1000. The low birth weight prevalence is also estimated at 14% (WHO, 2006b). The World Health Organisation in 2008 further noted that only 35.2% of births in Nigeria are attended by a skilled health worker and there has been a persistent reduction in the number of deliveries which occur in health facilities; this in contrast to South Africa (92%), the U.K (99%), U.S.A (99.5%) and UAE (100%), thus accounting for the mortifying maternal and infant mortality indexes (WHO, 2008b). Even amongst its West African neighbours, the skilled birth attendance indexes are poor compared to Togo (62%), Benin (74%), Cameroon (63%) and Ghana (49.7%). The National population commission (2004) reported that in parts of Nigeria, especially the Northern region, majority of births take place at home (66% births) under the guide of Traditional birth attendants who are not trained to manage life threatening complications in pregnancy/ deliveries (NPC, 2004). This in addition to the failing healthcare systems, corruption and infrastructural mismanagement amongst others has accounted for maternal mortality figures of 800-1,100/100,000 live births, infant mortality of 103/1000 live births, and perinatal mortality rate of 86/ 1000 people (WHO, 2007). 1 in 18 Nigerian women stand a lifetime risk of maternal death; the estimates of maternal deaths in 2005 in the West and Central African are 162,000 with Nigeria accounting for about 59,000 deaths alone (WHO, 2007).

Maternal death is simply the demise of a woman while she is pregnant or within 42 days after delivery or termination regardless of the duration or position of the pregnancy, from any grounds that is associated with or aggravated by the pregnancy or its management (WHO, 2007). The World Health Organisation revealed that an estimated 529,000 maternal deaths occur annually (1600 maternal deaths arise daily globally due to pregnancy complications)

and 99% of them occur in developing nations like Nigeria. There are 5.7million perinatal deaths recorded globally yearly and the developing world attributes for 98% of these deaths (WHO, 2006). Antenatal care coverage is essential in a country like Nigeria with deplorable health statistics. The World Health Organisation (WHO) further stated that about 61% of pregnant women make 1+ antenatal care visits, while only 47% of such women make up to 4 or more antenatal care visits for their routine antenatal care (WHO, 2007). The 2003 Nigerian Demographic Health Survey (NDHS) supported this, noting that approximately one-third (37%) of the pregnant women in Nigeria do not receive antenatal care of any sort. Even when they receive, the content of such care is of prime importance as well (NDHS, 2004). A similar report by the National population commission (NPC) in 2004 revealed that just 55% of women who had received antenatal care were told of possible complications that can result during pregnancy; the others were not educated of such and were shocked when they experienced any complications (NPC, 2004).

Looking at a maternal health condition like pre-eclampsia, the first step in preventing or managing this is an unyielding compliance by the pregnant mother to make antenatal care visits, as well as adequate information on maternal health/ complications in pregnancy being given to these women (using their preferred sources of such information- TV, radio, leaflets, community heads, town-criers etc). In summary, an effective way to improve the use of skilled attendance during delivery/ postpartum in Nigeria as well as continuity of antenatal care visits is by instigating their importance right from the very first antenatal care attendance by the pregnant woman.

2.2.6 EFFECTS OF ANTENATAL CARE ON THE HEALTH OF NIGERIAN WOMEN

A prominent retrospective study by Ekwempu, as well as recent studies by Igberase has revealed the influence of antenatal care on the outcome of pregnancies in Nigeria (Ekwempu, 1988; Igberase, 2006). Medical records were observed and subsequently analysed at the state University teaching hospital Zaria, Nigeria. Precisely 22,774 pregnancies were evaluated. The benefits were clear; pregnancy related complications were noted more in unbooked than booked patients. Such noted complications included pregnancy-induced hypertension, anaemia, malpresentation, and malposition of the foetal head (Ekwempu, 1988). Unbooked patients had an operative delivery rate (caesarean section) which was 3 times greater than the

booked ones, that is 18.2% to 6.4%. They also pinpointed that the occurrence of Vesico vaginal fistula (VVF) was more in unbooked than in the booked patients as well. Labour complications like cephalo-pelvic disproportion (18.1%), prolonged labour (15.8%), retained placenta (12%), pre-eclampsia (7.5%), eclampsia (5.5%), and uterine rupture (2.6%) were higher in unbooked than the booked patients (Ekwempu, 1988; Igberase, 2006).

According to Ekwempu, the maternal mortality figures were not excluded, with a rate of 24/1000 for the unbooked and 1/1000 for the booked patients regardless of the number of previous births they have had or their age group (Ekwempu, 1988). These observations were also supported by Ozumbia in 1993 who undertook a retrospective study of 83 pre-eclamptic cases catered for at the University of Nigeria teaching hospital (UNTH). The incidence of eclampsia for unbooked and booked patients was 14.3/1000 and 1.1/1000 live births respectively, further confirming the observation that eclamptic incidence was higher in patients who declined to attend antenatal services (Ozumbia, 1993). The benefits of pregnant women attending antenatal services have also been observed in the health outcome of their foetus. Perinatal rates have been noted in Ekwempu's studies to be three times lower in booked than in unbooked patients (Ekwempu, 1988).

The Nigerian Demographic health survey stated that only about 37% of Nigerian women access antenatal services and the frequency of repeated routine visits diminish as the pregnancy progresses (NDHS, 2004). This has placed a strain on the health outcome of these pregnant or recently delivered women. In line with this, studies by Kabir et al have shown that a range of cultural and religious bigotry have hindered antenatal access by the affected women; presence of male health workers for Islamic pregnant women and even staff insensitivity can deter women accessing early antenatal care (Kabir et al, 2005). The issue of language as a barrier also plays a strong role in preventing the communication of relevant health information between the health worker and the patient. Even in instances where interpreters are used, the level of knowledge and accuracy of information relayed by the interpreters are uncertain. A study by Carroli et al (2001) also noted that some indigenes blame the lack of their zeal to attend these antenatal services on the fact that they have limited knowledge about the availability of, and the content or advantages of accessing these services during pregnancy (Carroli et al, 2001). Myer et al (2003) further noted that the issue of costs prior to registering for these services, as well as the location of the antenatal clinics from their residences were also noted (Myer et al, 2003). In conclusion, the benefits of proper

routine antenatal care services far outweigh its non-attendance, and the advantages have an effect on both mother and child, reinstating the importance of these services to reproductive healthcare in Nigeria.

2.2.7 LIMITATIONS TO THE USE OF REPRODUCTIVE HEALTH SERVICES IN NIGERIA

Poverty plays a pivotal role in the use of health services and the availability of basic infrastructure and social amenities in Nigeria (See Appendix 6 for country profile). The strive to make ends meet hampers the safety of both the mother and unborn child, as she continually works hard under stress to meet the family's basic upkeep, rather than worry about her health as a key priority. Department For International Development (DFID) in 2006 reports that women residing in rural areas work between four to eight hours more than their male counterparts (DFID, 2006); this can have a derogatory effect on the health and safety of both mother and child. Statistics also show that there has been an increased incidence of poverty amongst houses headed by women in recent times. The DFID report also noted that 66% of the poor in Nigeria reside in rural areas, and the average income is 30% lower than in the urban areas (DFID, 2006). This is because women, especially those residing in rural areas, are prejudiced in decision making, accessing finances and jobs, owning landed properties, as well as education. Incidences of poverty were noted in the report to be higher in the North than in the Southern parts of Nigeria (this study looks at pregnant women in the Northern parts of the country). There has been an unequal disparity in the provision of social services and basic infrastructure between the Northern and southern regions of Nigeria; with the North being poorly developed (DFID, 2006). The Nigerian Demographic Health survey (NDHS) further reported that about 80% of the hospital beds in health institutions are disproportionately located in the South due to bias by past governments on infrastructural developments across the nation (NDHS, 2004). These have all contributed grave consequences on state of maternal, infant and child health across the regions of Nigeria, and the nation as a whole; thus the abysmal health indicators.

There have been various forms of government interventions towards reducing the rate of maternal morbidity and mortality in Nigeria. Despite this, the presence of financial, institutional and infrastructural barriers to maternal care has led to a downturn in these interventions. Women not seeking care or being denied essential healthcare services by the

health staff has been attributed to the presence of **User fees** in the public or private health facilities. The Centre for Reproductive Rights (CRR) in a 2008 report observed that even in some cases when the women are given treatment, they are subsequently detained by the hospital authorities when they run out of funds during the treatment process; others may shelve postnatal care even when primarily cared for in the health facilities so as to avoid detention. All these contribute to the lack of use of skilled maternal services by a large fraction of Nigerian women predominantly residing in rural areas (CRR, 2008). Recent Government propagandas about free maternal services are not usually all-inclusive (that is Physician's office visits, consultation, prescriptions and patient follow-up visits), and pregnant women are caught in the dilemma of paying for at least one aspect of the maternal care services (CRR, 2008). Reports by the CRR (2008) further noted that some of these free services are short-lived due to the lack of sustainable funds, staff shortage to handle increased patient pressure, insufficient medical supplies etc. Even basic materials like antiseptics, sanitary pads, syringes, cotton wools and plasters which are commonplace in well equipped health centres across the world are left on the onus of the pregnant women to purchase (CRR, 2008). Long queues are prominent in many public healthcare centres across the nation as Physician visits are not subject to an appointment only basis (as done in the U.K or U.S.A), placing pressure on the health staff who subsequently transfer their aggression on the patients.

Lack of critical knowledge and standard skills by some doctors, many midwives and nurses has been implicated in a 2007 Centre for Maternal and Child Health report as one of the leading causes of avoidable mortality amongst women, especially when complications in pregnancy is involved (CEMACH, 2007). A cross sectional survey by Lawoyin et al in 2007 supported this statement pointing out that a wide range of health care professionals have been unable to identify and manage medical conditions or emergencies outside their immediate skill base, especially in developing nations like Nigeria (Lawoyin et al, 2007). The CEMACH report also noted that skills requiring the resuscitation of a pregnant woman are also vital in the management of pre-eclampsia, and in severe cases the pregnant woman may have eclamptic seizures and become unconscious (CEMACH, 2007). Thus, the quality of care and services given to the affected women in Nigeria is uncertain. Pre-eclampsia is a serious maternal health condition which requires immense understanding and regular documented training, but there has been only little efforts done at consistently upgrading the knowledge base of the healthcare team in the country. The 7th report of the U.K. Confidential enquiry into Maternal and Child health in conclusion, reports that in a bid to making pregnancy safer,

sub-standard knowledge and skills must be upgraded regularly, with improvement in clinical care and antenatal services while implementing an audit system which checkmates the activities of healthcare workers towards the well-being of pregnant and recently delivered women who seek care in these health facilities (CEMACH, 2007).

2.2.8 SUMMARY

Most studies reviewed expressed the advantages of strict antenatal attendance and adequate clinical knowledge by the health workers. Others focus mainly on improving maternal and perinatal health, and these models which are applicable in the western worlds are usually assumed to be compatible in developing nations like Nigeria. Such acts have led to development of pregnancy-related and childbirth interventions that have failed in low-resource settings (rural areas) in these developing nations. This research tackles unanswered questions dealing with the level of awareness of community women in a rural setting especially first time and multiparous women as regards the burden of pre-eclampsia; its classical symptoms.

The study also attempts to evaluate if the healthcare workers are actually playing their roles in preventing this silent disease which is claiming a lot of lives in our communities; the standard of the antenatal care service given to the women, as well as the level of commitment by these health staff in reducing the incidence of eclampsia and ensuring more women seek antenatal care. If feasible preventive strategies are to be developed and implemented in low resource areas, then adequate research must be done in these areas to obtain relevant data required to design these models.

The nation's health indices have been pathetic and the need for timely tailor-made intervention which would mitigate the effects of these health conditions especially pre-eclampsia amongst Nigerian women should be accorded priority. The literature review has provided the researcher a rationale for carrying out this study so as to achieve its objectives, with the sole aim of seeking for cost-effective interventions which can incorporate indigenes in communities towards preventing the incidence and prevalence of pre-eclampsia amongst women. The literature review also gives good reason for the use of the selected research design and methodology towards achieving the objectives of this study, as the knowledge and

awareness of pre-eclampsia as well as the use of antenatal care services in the Nigerian context are being evaluated.

CHAPTER 3

METHODOLOGY

3.0 OVERVIEW OF THE STUDY

In undertaking this study, the researcher utilised cross-sectional approach with the aim of obtaining qualitative and quantitative data to provide an insight into the levels of awareness and the community's perception about pre-eclampsia in Northern Nigeria. It attempts to gather vital information from both the resident women and health workers about their knowledge and views about the issue of pre-eclampsia within their locality. Information was obtained using administration of pre-coded questionnaires amongst the study population, as well as the use of field observation. Questionnaires administered interviews were also carried out with representatives of relevant stakeholders within the region, giving the study an opportunity to in-depth analysis about the views, experience, practices and opinions of these people on the issue of pre-eclampsia, a salient factor for the prevailing increase in maternal morbidity and mortality in Nigeria.

Cross-sectional studies usually involve observing a sub-group of the study population at the same period of time, and give an idea of the frequency and characteristics of the disease of interest at a particular place within the set time period (Trochim, 2006). It tries to identify if a particular factor or a set of factors are related to the health effect being explored. It also analyses how these variables affect each other within a particular period of time. Hence, this was employed for the purpose of this research.

3.1 STUDY DESIGN

3.1.1 RESEARCH APPROACH

This study will utilise a **cross-sectional survey approach**, in obtaining both qualitative and quantitative data from respondents. The use of Positivist and Interpretive methodological approach will be employed; while the former adopts precise quantitative data, the latter utilises qualitative data (Neuman, 2006).

A **QUALITATIVE approach** is otherwise known as interpretivism, as it allows the researcher have an in-depth insight into a particular issue been studied (Myers, 2002). This approach provides the researcher with large volumes of information as it studies the values, beliefs, ideologies, attitudes and attributes of varying factors and their interaction with the behavioural patterns of individuals functioning alone or as part of the society. Such nature of information is far-reaching from other research methods that employ statistical procedures and numerical figures (Myers, 2002).

This study examines the relationships between human behaviour, peripheral factors which directly or indirectly affect human action and the routine use of antenatal care services effectively, thus preventing possible complications in pregnancy. Hence, the importance of a qualitative approach to this study is invaluable as it requires intensive data collection within a period of time in the naturalistic setting providing useful exploratory conclusions/ recommendations drawn from the study (Myers, 2002). There are diverse types of qualitative research methods which include Interpretivism, Action research, Ethnography, Grounded theories, Case study and Phenomenology (Myers, 2002; Neill, 2006); of all, Interpretivism will be an approach utilised in this study to explore the richness and complexity of the subject matter. Qualitative approach utilizes three main data collection methods which include written description by participants, collaborative interviewing, and field observation (Neill, 2006) and its strength lies in the validity of data obtained. Semi-structured Questionnaire based interviews with relevant stakeholders, as well as field observation by the researcher will also be used in this study for obtaining qualitative data for analysis.

QUANTITATIVE methodological approach on the other hand, is a deductive research process that entails the use of figures and other numerical information (Neill, 2006). They employ mathematical models in establishing causal relationships between variables, and

statistical methods are utilized in testing the research hypotheses. Numerical data are produced with quantitative methods and they are analysed and reported as statistical values and graphs (UWE, 2007). While qualitative approach is more exploratory towards generating the research's hypothesis, quantitative approach is usually more focused, aiming at testing the hypotheses (Neuman, 2006). The strength of Quantitative methods lie in the reliability of data obtained as they can be done on a large scale, unlike the Qualitative methods.

Quantitative methods could be used in profiling the study group, noting the proportion of them that have certain behaviour, their behavioural intentions, attitudes and knowledge about pre-eclampsia and the use of ante-natal services; also used to note whether specific determinants predict behaviour at a statistically significant level (Oak Ridge Institute, 2007). For the purpose of this study, close-ended questionnaires will be used to obtain quantitative data from the respondents. A statistically valid random sample would be used, so as to obtain and analyze data within a short period of time as the participants are provided fixed response close-ended options. The results obtained can also be generalised to the entire population in the study locality, and beyond. A possible limitation of the quantitative research method is that they have limited ability to probe answers from the participants, but this can be countered using the qualitative research methods which provides in-depth analysis of a subject matter.

3.1.2 METHODOLOGY

This study is undertaken to answer the question **that if community awareness is promoted through healthcare advocacy and routine antenatal care, can this reduce the incidence of pre-eclampsia and consequential eclamptic emergencies in the community and society at large**. This study employs **cross-sectional survey method**, a common type of research tool used to collate information from the sample of interest to the study (CSU, 2008). Other research methods which could have been used include case study, cohort or longitudinal studies, ethnography, or randomised trials (Neuman, 2006; Trochim, 2006). The survey method was selected as it is a straightforward technique by which samples of a cross-section of respondents are selected at random from the study of interest and the data collection tool is administered to them (Social Research Methods, 2006). It involves asking questions to respondents about their self-reported beliefs or opinions, which is applicable to this study (Neuman, 2006).

Surveys are easier to complete within a small time-frame and cost effective unlike **cohort / longitudinal studies** or **randomised trials**, and deals with varied range of respondents (first-time mothers or not) unlike the **case study** which evaluates a particular set of people (Neuman, 2006; CSU, 2008). It can also deal with small, medium or large-scale sample size. This survey method suits the study population as it assesses hard-to-reach areas, does not directly interfere with the indigenes way of living (giving them freedom to partake), and is designed in a way to respect their cultural/ religious beliefs being predominant Moslems (NPC, 2004). There is also no loss to follow-up. A possible limitation to this research method is the difficulty in making causal inference (Levin, 2006).

Surveys can either be undertaken through Questionnaires (which the respondents completes without bias) or Interviews (which the interviewer collates based on what the respondent says) and both forms were employed in this study (Social research methods, 2006). This study will be undertaken mainly in a hospital setting; hence the response rate of the data collection tool used will be subsequently higher. Respondents could also ask questions about the study should they require clarification, thus ensuring valid responses (Trochim, 2006).

3.1.3 DATA COLLECTION TOOLS EMPLOYED

The primary method of data collection in this study was through the use **of semi-structured pre-coded questionnaires, in-depth questionnaire based interviews** as well as **field notes** (Denscombe, 2008).

3.1.3.1 QUESTIONNAIRE

This **self-administered questionnaire survey** process will be undertaken to obtain quantitative data which would be triangulated with data obtained from the qualitative procedures (Denscombe, 2008). Close-ended questionnaires consisting of 15-20 short style questions will be employed in this study (see section 3.1.4 for benefits); while few open-ended questions were included (e.g. **what do you think eclampsia is?**) to obtain a qualitative perspective of the subject matter from the respondents (Newman, 2006). Two sets of questionnaires have been designed, one for the pregnant women and the other for the health workers (see Appendix 12). It could be argued that when questionnaires are developed by the researcher, they could lead to bias, self-reporting and false representation as data derived

could be representing the view of the researcher and not the study participants (Neuman, 2006). Also the validity of this new set of questionnaires can be questioned.

The questions are unambiguous, short, and simple, as the educational level of indigenes in the study location was placed into consideration (Fink, 2005; Neuman, 2006). The two-set questionnaires are divided into sections using themes seeking the demographic details of the study participants, as well as their basic knowledge about pre-eclampsia; attitudes and behavioural intentions regarding antenatal care services, information points, need for further training, and satisfaction of health services received (See Appendix 12). Response like **'yes', 'no'**, and '**don't know**' were used providing easier interpretation. The cover letter on each questionnaire distributed was well-defined and concise, providing prospective participants with relevant information about the study and its objectives so as to improve response rates.

In this study, the questionnaires were PILOT-TESTED to evaluate its **feasibility** for the study and also the **validity** and note if the answers obtained are relative to the study's objectives (Fink, 2005). Few changes were made to the questions after the initial pilot-run so as to obtain data relevant to the study's set aim and objectives, prior to carrying out the main study process. This enhances the validity of the questionnaires used (British Dental Journal, 2003). Double-barrelled, double-negative and unclear questions were rephrased; also questions which were vague, out of context, leading (e.g. 'you attend antenatal services, don't you?'), and beyond the respondent's capabilities were eliminated (Neuman, 2006).

The process of content validity was performed on the questionnaires, where a focus group comprising two doctors, two pharmacists, a midwife and nurse, and two patients with previous history of pre-eclampsia reviewed questions on the questionnaire ensuring its **validity**. During the pilot run of the questionnaires, the test-retest process was also performed noting the consistency of respondent answers given after a time gap, ensuring **reliability** of this data collection tool.

3.1.3.2 FIELD OBSERVATION

Extensive field observation to obtain qualitative data is another tool employed. The researcher utilised a pattern necessitating direct observation in obtaining qualitative data while conducting the study (ESRC, 2007). This was pertinent to gain in-depth knowledge

about varying factors which could have an impact on the level of awareness on the issue of pre-eclampsia at grass root level. Also, observing how these women embrace antenatal care services, and how future strategies by the Government, health authorities, and Non governmental organisations could be designed to have increased outcomes towards influencing women at all levels of socio-economic class to embrace better maternal health in Nigeria (COMPASS, 2007b).

3.1.3.3 QUESTIONNAIRE BASED INTERVIEWS

Semi structured open-ended questionnaire based interviews will be used in obtaining qualitative data as they allow extensive probing of key informants in a study process (Neuman, 2006). Detailed information can be obtained as open-ended questions are usually asked and the interviewee gives answers which are representative of his/her opinion on the subject matter being studied. This method was also adopted due to the tensive religious nature of the study location as some respondents desist attempts to have their responses tape-recorded (NDHS, 2004); hence their responses are scripted by the research assistant (Neuman, 2006).

3.1.4 PROS AND CONS OF THE DATA COLLECTION TOOLS USED

In this study, mainly **close-ended questionnaires** were employed. They are quicker and easier to answer, which can then be coded and analysed efficiently. They allow respondents answer sensitive questions easily, help avoid conclusions, and give opportunity for less articulate respondents to answer more confidently (Neuman, 2006). The few open-ended questions allowed for self-expression and richness of details on the subject by the respondents. The questionnaires were self-administered allowing for a high response rate, and since the researcher was available to answer questions, this suited the respondent's ability to answer (as a proportion of them had low educational levels). A limitation may be self-reporting; social desirability bias where respondents may give a normative response. Also, close-ended questions can suggest ideas respondents may not have, those with no opinion still get to answer anyway, and misinterpretation of questions can go unnoticed; these were minimised during the pilot-run and content-validity process (Neuman, 2006; Trochim, 2006).

A feminist approach was employed for the **questionnaire based interview**, allowing the respondent to be open, receptive, understanding and more comfortable in expressing their ideas and personal beliefs on the subject of pre-eclampsia. It allows for obtaining answers to open-ended or complex questions, as well as provides opportunities for visual observation of the participants (Fink, 2006; Neuman, 2006). A possible limitation of this method in this study is the Islamic religious nature of the study population (as the husbands were non-receptive to other people seeking information from their spouses); majority of the interviews had to be type-set as they were against the use of tape-recorders for fear of reprisal (Neill, 2006). Also, the issue of Interview bias was noted, which was minimised by avoiding subversion by the interviewer and proscribing interviewer's personal characteristics during the interview (Neuman, 2006). Language barriers were countered by recruiting a research assistant conversant in the local dialect.

Field work is less expensive compared to many kinds of research methods (Neuman, 2006). It gives the researcher the opportunity to probe the study group in a natural setting allowing them express their opinions/ feelings freely. It allows for learning about the study group and their setting/ location, and gives an understanding of extraneous factors which affect their actions (Graziano, 2007). Limitations to this method is the ethical issues where the study participants may feel deceived or taken advantage of (abuse of confidentiality); this is countered if the researcher undertakes an overt field observation, the respondent's confidential information are concealed during the reporting phase of this study, and respondents are de-briefed when the study is concluded (ESRC, 2006; Neuman, 2006). Also, limited representativeness of the findings as it is difficult determining if participants observed represent the general population (Graziano, 2007). Thus, the findings are triangulated with the others.

3.2 STUDY AREA AND POPULATION

Figure 2: *Map of Nigeria, showing the study location of Bauchi state, North-eastern Nigeria (highlighted in green)*

Source: COMPASS, 2007

The selected location for which this study was undertaken is in Bauchi state, North Eastern region of Nigeria. This study was carried out in Ganjuwa local government area, a rural setting with two main Primary health care centres in Kafin-Madaki and Soro villages (Mailafia, 2004). The referral secondary health centre is located in the city of Bauchi and approximately 24 kilometres from Ganjuwa. The population of indigenes in Ganjuwa LGA is 280,468, of which the target population of women are 134,200 (NBS, 2006). Kafin Madaki is the seat of the Local Government chairman's office as well as the administrative team, little wonder the Local government's General Hospital is located here. The majority of indigenes are farmers with crops and livestock rearing being the major sources of income in the community; it boasts of a vast amount of fertile soil and agricultural products like maize, groundnut, millet, rice and guinea corn are the major products from this state (Nigeria Galleria, 2004). The level of education amongst the indigenes is poor with majority of the female population attaining just primary levels of education (NDHS, 2004). The basic social services and infrastructures are deplorable and the General hospital is extremely short-staffed, with healthcare assistants making up the bulk of the staff force (See Appendix 6 for full details).

Due to the Islamic nature of the village, most traditional and religious heads are of the opinion that women seeking health services must be attended to by female healthcare workers (NDHS, 2004). Reproductive health and contraceptive programmes are seen as a western ideology which must not be followed and are completely unacceptable; polygamy and the raising of large families are prominent amongst the indigenes (African journal, 2004). These

place immense burden on the overstretched deteriorating health facilities available within the study location, as well as on the finances of these people as healthcare provision are completely an out-of- pocket expenditure (NDHS, 2004). The effects of cultural and religious barriers and their perceptions create limitations to the effectiveness of maternal health delivery amongst women in this rural area; these must be put into consideration if any framework to improve the quality and service of antenatal and maternal health services in the region are to be designed and implemented successfully (UNICEF, 2007; USAID, 2008).

3.3 SAMPLING/TARGET POPULATION

Neuman (2006) identified a **Target population** as a concretely specified large cluster of many cases through which the sample is drawn by the researcher, and which the results obtained from the sample are generalised. It includes individuals or social units whose attitudes, knowledge, and perception the study results are meant to represent. A **sample** is simply a subset of a given population that is selected due to its ability to provide relevant information, its representativeness of the target population, as well as other factors like participant accessibility and costs (Wright et al, 2002; UTEXAS, 2007). Two villages are selected from the study area, based on the presence of the General hospital and the Primary health centre accordingly; they include Kafin-Madaki and Soro villages (Mailafia, 2004). The target population in this study was the pregnant women and healthcare workers resident in the community. The **reference population** which the findings are to be generalised are the women in Nigeria (Driver, 2006). Using the two villages, a large turnover of women and health workers could also be obtained for the sampling process. The main goal for this sampling procedure was that it should be representative of the general population (Social research methods, 2006).

The selected sample would be obtained using **simple random sampling method**, preventing selection bias. This does not guarantee it is perfectly representative of the population, but it is close to the population most of the time (Neuman, 2006). The participants are then selected suitably for every second pregnant woman (that fits the inclusion criteria) who attended the hospital consequently (n, n+ 2, n+ 4 etc) and informed consent duly obtained, prior to their partaking in the study (CSM, 2008). This was because it would be difficult recruiting a larger sample of respondents (who are pregnant in the small rural community) based on the inclusion criteria (Neuman, 2006). It has been identified by Brink et al in 2006 that power

analysis is usually employed in calculating probability sampling, however this was not needed in this study (Brink et al, 2006).

For the hospital based questionnaire administration, the Medical officer in charge would be consulted and a list of available staff was obtained. Permission was given for the administration of questionnaires to the women/ mothers (both first-time and multigravidae) who attended for out-patient treatment, routine check-up or antenatal care services at the Primary health centre and General hospital respectively (CSU, 2008).

Inclusion criteria for the women selected at random from the study population include either first time pregnant women or women who have had at least one birth before. They included women aged between 15-49 years, which is the active child-bearing age in the region (NDHS, 2004). All men as well as women who are not or have never been pregnant before are **excluded**, as they could not provide valid answers on their experience and knowledge of pre-eclampsia or antenatal care services. Also women outside the 15-49 age bracket and those who were too sick or had any form of mental incapability are **excluded** from the study.

3.4 DATA COLLECTION

Two research assistants (a male and a female) were recruited, mainly for the process of translating the questionnaires from English to Hausa and Fulani which were the predominant local dialects in the study location. This was pertinent due to the low educational attainment of most of the study participants (as a large fraction of the female population within the region did not exceed primary levels of education). The assistants also partook in participant selection and questionnaire distribution within the healthcare settings. Due to the Islamic religious nature of the indigenes, the female assistant was helpful during household drop-offs where male spouses of the study participants would not entertain any other man (NDHS, 2004). With reference to the view by Social Research Methods (2006), the research assistants were duly informed on the study aims and objectives, trained about survey research methods, sampling process, identifying respondents, and interviewer bias amongst others, to ensure the validity of study findings (Social Research Methods, 2006).

A total of 126 women were randomly selected mainly at the hospital sites during antenatal days over a **ten day period** within the study time-scale and invited to partake voluntarily in

the study (see Appendix 4). Only 103 women participated and their questionnaire data was obtained. For the healthcare workers, samples were drawn from the healthcare staffs located in the two health centres at Kafin-madaki and Soro villages (including Doctors, nurses, midwives and healthcare assistants which make up the bulk of the sample). In all, 32 healthcare staffs were selected and invited to partake in the study; only 26 health staffs participated in this study.

A large proportion of the study participants could not write, hence the research assistants aided in helping them fill the questionnaires in the exact interpretation of their statements (NDHS, 2004). Two sets of Questionnaires were used (and possible bias was eliminated after testing for ambiguity, validity and reliability were initially conducted) (Trochim 2006, UTEXAS, 2007). Each questionnaire took approximately 18 minutes to administer. One set was distributed to the random sample of pregnant women, while the other set was distributed to the health care workers who partook in the study. The response rate was relatively high as the questionnaires were self-administered within set locations, limiting possible losses in transit. Household drop-offs were easily undertaken by the research assistants for hard to reach women using this data collection tool (CSU, 2008).

Extensive field notes were obtained by the researcher during the visits to the study location and hospital sites. Notes on the level of care given to pregnant women by the health workers during antenatal visits, the state of medical facilities and medications on ground and the level of comprehension of healthcare staff in dealing with pre-eclampsia and eclamptic emergencies in their units were gathered. Also the attitudes, beliefs, socio-economic and religious attributes of the study population were also noted.

Questionnaire based interviews were self administered in this study with relevant stakeholders (key respondents) including one representative from the Public health Unit of the Local government council, two representatives from a Non governmental organisation in Nigeria with strong interests in maternal health and gender inequality, and two traditional birth attendants (TBA) to obtain insights from differing parties with a common interest. A key informant guide was used to conduct the questionnaire based interview (See Appendix 15).

Particular interviews required the use of Hausa-speaking interpreters, especially when the traditional birth attendants were been interviewed so as to counter the language barriers experienced (NDHS, 2004). Responses obtained were scripted by research assistants. The

open-ended questionnaire based interviews were carried out at the Local government council's office and the branch office of a Non governmental organization over one week period, and each lasting approximately 30-40 minutes. Data obtained were then triangulated and checked for accuracy against the original themes of this study, promoting its validity (Trochim, 2006).

3.4.1 DATA QUALITY CONTROL

Data collected on each day of the data collection process was reviewed, amended and analysed daily by the researcher and research assistants at the stated meeting point to ensure its standard and quality. Also, only recent information as regards the present pregnancy experience was requested from the respondents to prevent recall bias. This is in a bid to ensure data collected was in harmony with the study's aim and objectives set out during the beginning of the study process. Data obtained through questionnaires were coded by the research team before data entry ensuring accuracy of collected data.

Reliability is the ability of a measure to give consistent results over a time frame (Graziano et al, 2007). Three types of reliability exist (interrater, internal consistency, and test-retest) but test-retest method was used during the pilot-run of this study. Results from the questionnaires remained stable as 6 participants were tested twice within a fortnight, giving a reliability of 0.78.

Validity means the effectiveness of data collection tools to measure what they are supposed to. While measures cannot be valid unless it is reliable, measures can be reliable without being valid (Graziano et al, 2007). A focus group (health workers and patients) was utilised during content-validity process of the designed questionnaires, where non-valid questions were removed or altered so they can obtain relevant data for analysis (see section 3.1.3.1).

3.5 DATA ANALYSIS

Data analyses for the qualitative data obtained were validated through an effective feedback method, as well as appropriate interpretation. Due to the low level of educational attainment amongst majority of the women in the locality, an interpreter was utilised to effectively communicate with the participants. Data obtained from the questionnaire based interviews was analysed using content analysis method. These data were extracted and type-set based on

named themes of study for easier review using MS Access/ Word applications (Neill, 2006). A list of coded categories was drawn up and each segment of transcribed data was subsequently sieved into one of these categories accordingly (Gall et al, 2003). QRS NUD*IST was the computer database package used for this process.

With regards to obtaining quantitative data, surveys using self administered semi-structured questionnaire were utilised to determine demographic, educational and socio-economic status, as well as identifying the level of knowledge and awareness of both the women (primigravidae or multigravidae) and health workers about pre-eclampsia, and the use of antenatal care services. Data obtained from these questionnaires were then analysed using statistical packages including SPSS version 12 and MS Excel 2007. In summary, the raw data obtained from the pre-coded questionnaires was obtained and decoded using Microsoft Excel 2007. SPSS version 12 statistical package was also used in analysing obtained data, based on descriptive analysis as well as statistical significance of $p=0.5$.

Field notes obtained by the researcher were subsequently analysed and important descriptive categories were identified accordingly. The sample of five respondents was obtained by non-probability convenient sampling, and the inclusion / exclusion criterion was used to obtain the required sample for the study (Brink et al, 2006; Neuman, 2006).

3.6 ETHICAL CONSIDERATIONS

Before the commencement of this study, ethical approval was obtained from the University of Bedfordshire Research Ethics committee after the research proposal was reviewed extensively (Appendix 16). Approval was also obtained from the National Health Research Ethics committee (NHREC) in Nigeria, which regulates all research procedures carried out within the nation, considering the safety of the indigenes in mind (see Appendix 11). Also consent was obtained from the Medical officer in charge of the Hospital sites used for the study (Appendix 16). Informed written consent was obtained from all the study participants prior to their partaking in the study. The overall conduct and supervision of the study was the researcher's responsibility (NHREC, 2007).

3.6.1 SELECTION PROCESS

The study sample was selected in a manner where each member of the target population had a relative chance of being selected; that is, a non-zero probability (Wright, 2002).

3.6.2 PARTICIPANTS

All questionnaires had a top page cover letter stating the aim and objectives of the study, benefits, and confidentiality rights of the respondents ensuring transparency and promoting trust-relationship with respondents (NHREC, 2007). These were extensively discussed with the respondents. A second page seeking informed consent from the participants was included (see Appendix 13) and they duly notified their acceptance of the conditions of the study before partaking in the questionnaire survey (Trochim, 2006); thus obeying the principle of **voluntary consent** (Neuman, 2006). Those unable to provide written consent gave witnessed thumb-printing. **Anonymity** was upheld as personal information like full names, date of birth and addresses of the participants were not requested (ESRC, 2006). All respondents were given an identification number, and this appeared on the respective questionnaires as well (Neuman, 2006). The conduct of the research was monitored by the Research ethics committee within the study location to ensure strict compliance to set guidelines and best practices.

The researcher was also bound by a professional and moral obligation to ensure that participant **autonomy** (rights of choice) was upheld (Trochim, 2006). They were informed of their rights to partake in the study (Appendix 14), as well as withdraw from the study at any time without being prejudiced. The respondents were not exposed to potential risks (that is, given any therapeutic intervention which may cause physical/ physiological harm, discomfort or stress) or disregarded throughout the study; respecting the law of **beneficence** (best interest of participants) and **non-maleficience** (do no harm) (ESRC, 2006; Trochim, 2006). Their privacy was respected and any form of deception during field observation was at a minimal level, and participants were subsequently **debriefed** at the end of the study (Neuman, 2006). As this study involved non-therapeutic procedures and not interventional studies; no injuries, disability or deaths were recorded (NHREC, 2007).

Special populations which include the disabled or mentally incapable who cannot give their true voluntary informed consent were excluded from this research to avoid being indirectly coerced to partake in the study (Neuman, 2006). Due to the nature of the study location, all religious and traditional ethnic beliefs were completely respected; hence the respondents were not degraded. Community consultation was obtained from the village heads and gate-keepers before proceeding with study, and they were updated on progress of research accordingly (NHREC, 2007). A female research assistant was employed in obtaining data from unwilling heads of households who disapproved of the male researchers having direct contact with their spouses or family members.

All collated data, tapes, scripts and questionnaires have been stored and kept safe from public view both in hard and soft copies (pass-worded), as the case may be upholding the principle of **non-disclosure** and **confidentiality**. They will be stored for a period of 5 years according to standard guidelines (Trochim, 2006). Interests of all parties were protected as results and benefits of the study were subsequently made available to the respondents and the community through the hospitals and the local government council. The professional integrity of this study was ensured; there were no undeclared conflict of interest in this study as the research was self-funded (ESRC, 2006).

3.7 TIME SCALE AND COSTS OF STUDY

The time scale of the study was for a period of six months, between March and September 2008. Two trips were made to the study location, where pilot testing and subsequent data collection, as well as valuable meetings with relevant parties as regards the study were conducted (See Appendix 4 for Gant chart). Also pilot testing of the study questionnaires were conducted during one of the visits to test the reliability and validity of the questionnaires and other data collection tools, as well as make amendments to ambiguous questions. The costs incurred during the study have been documented in Appendix 4.

3.8 SUMMARY

This study employed a cross-sectional survey design as its benefits outweigh the other research methods in helping the researcher achieve the study's primary aim and objectives. Qualitative and Quantitative research approaches were utilised to obtain important data from

the study population using data collection tools like semi-structured questionnaires, field notes and questionnaire based interviews. A randomised sample size of 103 pregnant women and 26 healthcare workers were used for the questionnaire process. Ethical considerations were also noted and fully respected during the process of this study in accordance with set guidelines.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.0 OVERVIEW OF THE RESULTS

Responses from the questionnaires provide the study with quantitative data for further analysis. Qualitative data was also obtained from the use of semi-structured questionnaire based interviews and deductions from the field observation were also noted. This section interprets the results from data analysis in a descriptive manner using tables, histograms (bar charts) and pie charts; inferences were subsequently made from them. The results were reported in three parts: Questionnaires for the pregnant women, health workers, and semi-structured interviews/ field observation. Since data was collected from a simple random sample, extensive statistical calculations were not applicable as the sample size utilized based on the inclusion criteria could mainly be used to provide descriptive statistic conclusions (Graziano, 2007).

4.1 QUESTIONNAIRE SURVEY/FINDINGS

4.1.1 SAMPLE CHARACTERISTICS

From the expected 126 women who fit the inclusion criteria, and were supposed to partake in this study, only 103 women participated in the questionnaire survey. All the participants were women (n=103). The mean age for the women who participated was 27.84 ± 4.5 years; majority of the respondents fall within the 15-24 years age bracket (41.74%). The level of educational attainment for most of the respondents was low (see table 1 below). Of the total respondents, only 6.80% have completed a college or university program, with almost half of

them uneducated (47.57%) or in primary level (34.95%). 10.68% of the women have attained secondary education. The occupation for the participants fell around five classes ranging from farming (21.36%), business women (11.65%), students (11.65%) and teachers (3.88%). About 51.46% of the participants were housewives.

TABLE 1

Sample characteristics of Questionnaire participants (Women)

		Number of women (n)	Percentage (%)
Age (years)	15-24	43	41.74
	25-34	39	37.86
	35-44	18	17.48
	45-54	3	2.91
Education			
	Uneducated	49	47.57
	Primary	36	34.95
	Secondary	11	10.68
	College/ University	7	6.80
Occupation			
	Housewife	53	51.46
	Farmer	22	21.36
	Businesswoman	12	11.65
	Student	12	11.65
	Teacher	4	3.88

N= 103

With regards to the health workers who participated in the second questionnaire, majority of the respondents were women (n=16) and the rest of them, men (n=10). 32 health workers were initially drawn to partake in the questionnaire process, but only 26 finally participated in the study (see Table 2 below). The mean age for the health workers was 37.69 ± 4.2 years. A large fraction of them were in the 25-34 years age group (42.31%) and 35-44 years age group (30.77%). The educational status was quite high as expected with 61.54% having attended

college/ university, 23.07% attended a course of vocational training, 11.54% had attended secondary school and only 3.85% of the health workers attended primary school. From the health workers who participated, the healthcare assistants made up a large fraction with 38.46%. Other health workers include the Doctors (15.38%), Nurses (26.92%), Midwives (11.54%) and Pharmacists (7.69%).

TABLE 2

Sample characteristics of Questionnaire participants (Health workers)

		Number of health workers (n)	Percentage (%)
Age (years)	15-24	4	15.38
	25-34	11	42.31
	35-44	8	30.77
	>45	3	11.54
Education			
	Primary	1	3.85
	Secondary	3	11.54
	Vocational	6	23.07
	College/ University	16	61.54
Occupation			
	Doctor	4	15.38
	Pharmacist	2	7.69
	Midwife	3	11.54
	Nurse	7	26.92
	Healthcare Assistant	10	38.46

N= 26

The response rate for the pregnant women who partook in the study was 81.75%, while that for the health workers was 81.25%. This shows a high response rate, supporting the effectiveness of the research design for this study.

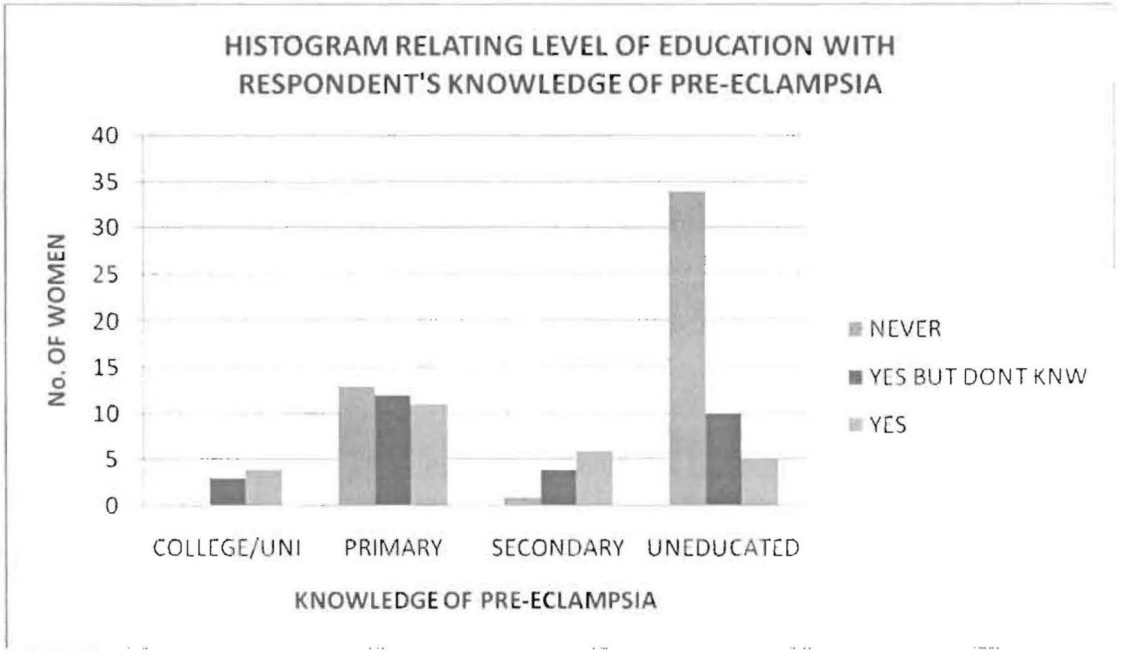
A) PREGNANT WOMEN

4.1.2 RESPONDENTS EVALUATION OF KNOWLEDGE AND AWARENESS

The evaluation of the knowledge and awareness of the pregnant women in this study on the issue of pre-eclampsia and the use of ante-natal care services, as well as that of the health workers were measured. Criteria for health evaluation utilised indices which included if this was their first pregnancy (primigravidae), the total number of previous pregnancies for each woman (multigravidae), registration/ knowledge/ and number of times they have all attended antenatal care services, and the services provided by healthcare team during antenatal care visits.

4.1.2.1 KNOWLEDGE ABOUT PRE-ECLAMPSIA

Figure 3



The level of knowledge about pre-eclampsia for each woman, including symptoms, or previous experience, were evaluated using the questionnaire data tool. Due to the poor educational level of the study population (47.57% of the respondents were uneducated); a relationship between the educational levels of the respondents and their knowledge of pre-eclampsia was evaluated.

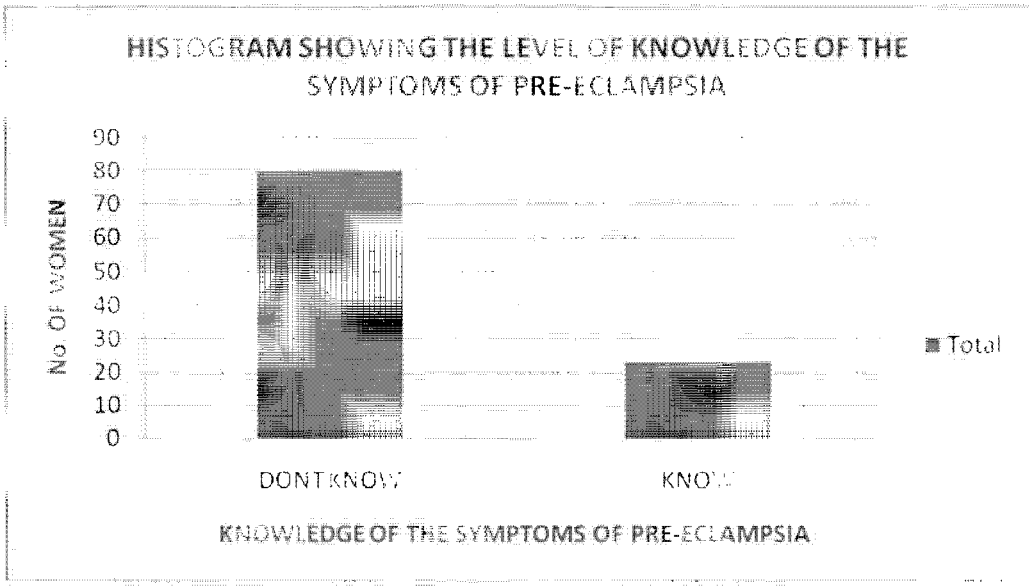
Majority of respondents knew nothing about pre-eclampsia. 34 of the uneducated women (69.39%) had no knowledge of pre-eclampsia, 10 of them (20.41%) have heard about it but do not know what it really is, and 5 of them (10.20%) had concise knowkledge of what pre-eclampsia was. As a community member stated, 'pre-eclampsia is a disease of the Gods occuring in those with familial curses'. Others felt it was a form of malaria.

It was noted that the knowledge of pre-eclampsia progressively increased as the educational status of the respondents increased; all those who had attended college/ university had concise knowledge of pre-eclampsia.

4.1.2.2 LEVEL OF KNOWLEDGE OF THE SYMPTOMS OF PRE-ECLAMPSIA

The basic knowledge of the symptoms of pre-eclampsia was evaluated. From the 103 respondents of the study, 80 of them (77.67%) do not have any knowledge of the symptoms of pre-eclampsia while 23 of them (22.33%) do (see figure 4 below).

Figure 4



Headache, vomiting and fever were the most commonly listed symptoms among respondents, revealing the absolute lack of knowledge amongst the women. This reveals the poor content of antenatal care received as a proportion of these respondents have registered for ANC.

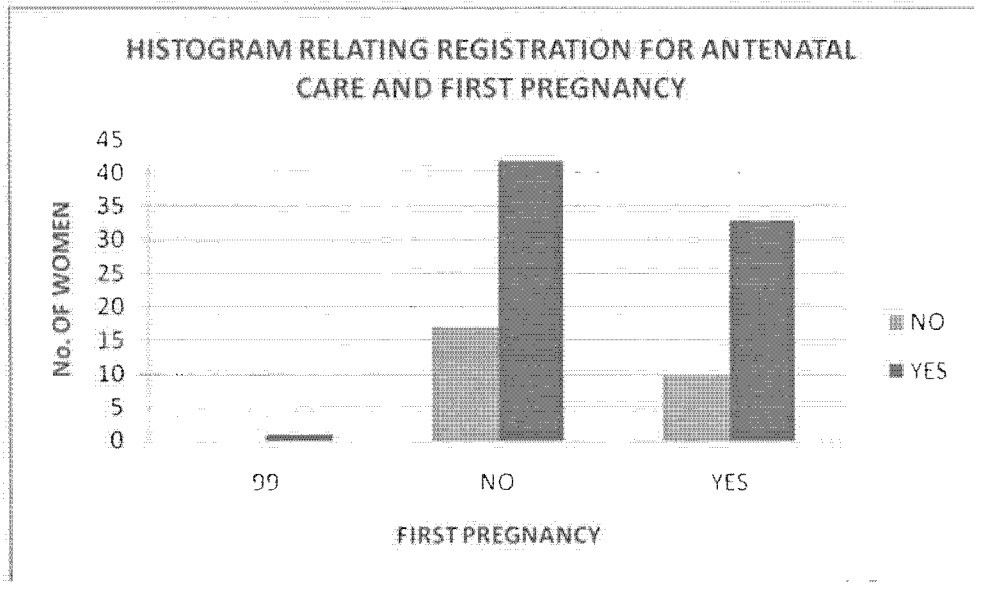
4.1.3 USE OF ANTENATAL CARE SERVICES

Relationship between antenatal care services, their initial registration, routine use, and the satisfaction from the services received during such visits was assessed. This was important if concise conclusions on factors pre-disposing these women to pre-eclampsia are to be evaluated.

4.1.3.1 REGISTRATION FOR ANTENATAL CARE SERVICES

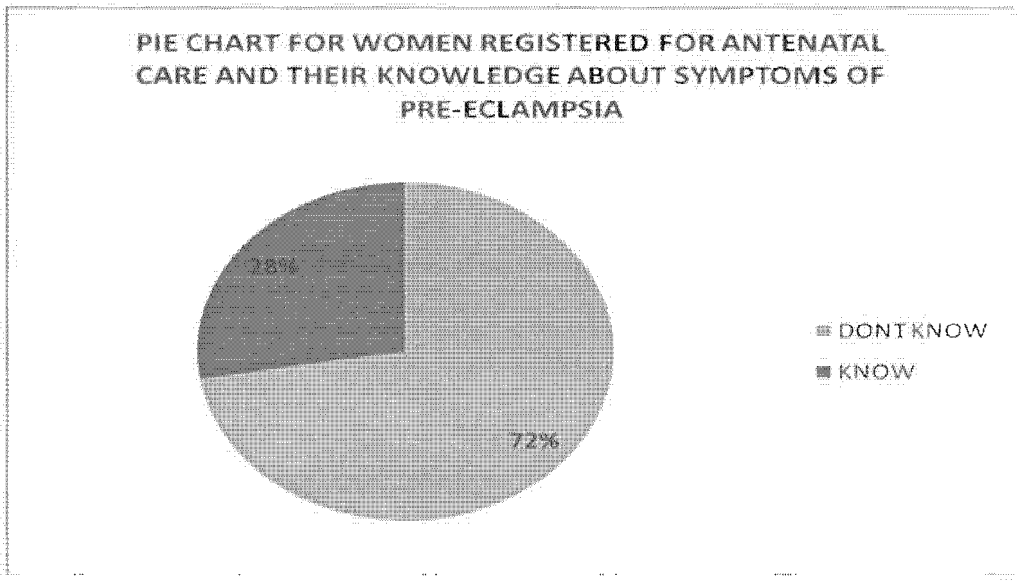
The relationship between registration for ANC and if the woman was in her first pregnancy was established (see figure 5). Of the 103 respondents, 43 were in their first pregnancy, while 59 women have had previous pregnancies. There was one non-valid response (missing data) to this question on the questionnaire. 33 of the first-time pregnant women (76.75%) had registered for antenatal care while 10 (23.25%) had not; showing that three-thirds of the first-time pregnant respondents had actually registered for antenatal care. For the multigravidae, 42 (71.19%) had registered for antenatal care while 17 (28.81%) had not.

Figure 5



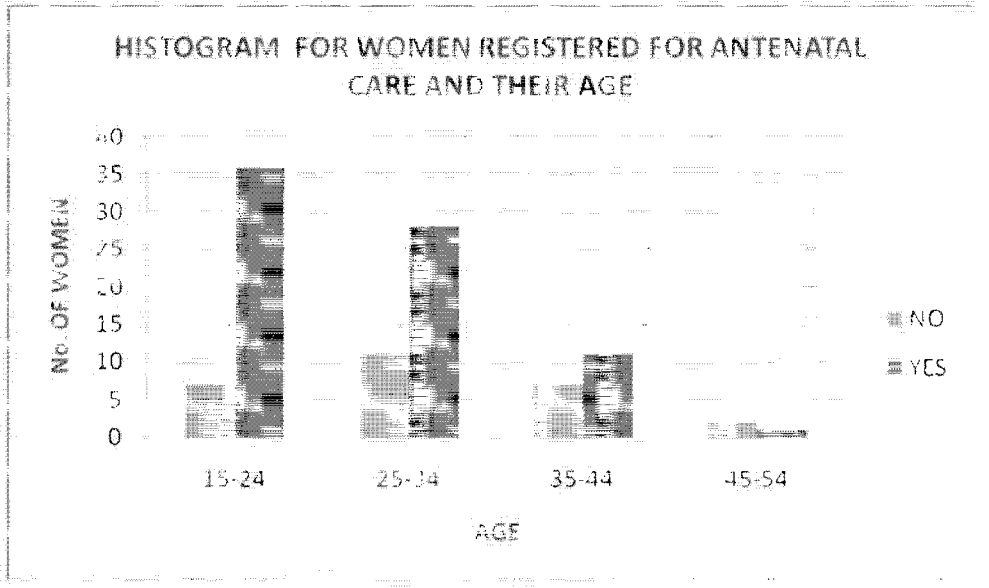
However in figure 6, it was noted that only 28% of the 75 women who had registered for ANC actually knew about the symptoms of pre-eclampsia, thus criticising the effectiveness of the content of care and health information these women receive during ANC visits.

Figure 6



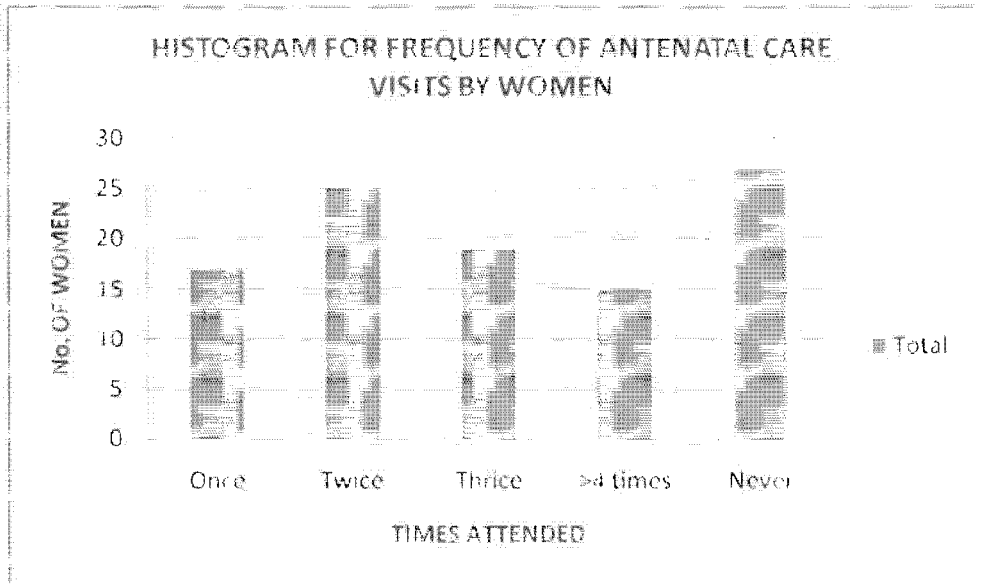
The relationship between the age group of the women and their registration for antenatal care services was evaluated. Majority of the women who fell within the 15-24 years age group had registered for antenatal services (83.72%); followed by those within the 25-34 age groups (71.80%). These set of respondents expressed their happiness to register for antenatal services, despite challenges like long waiting times and costs. (See figure 7).

Figure 7



Similarly, majority of the women had made two antenatal care visits in this pregnancy, after which a decline in attendance was observed. Of the 76 respondents who had registered for ANC, while 17 women (22.37%) had attended only once, 25 (32.89%) had made two visits; 19 (25%) made three visits and 15 (19.74%) had made four or more antenatal care visits (see figure 8). Majority of the respondents stated they saw no need to continue as they didn't feel ill; others implicated user-fees and long-waiting times as barriers.

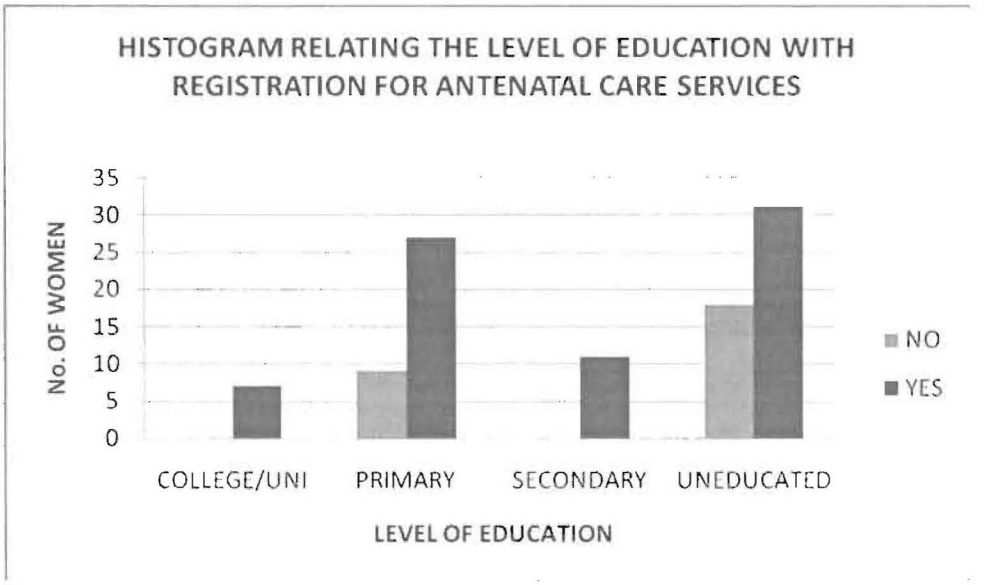
Figure 8



4.1.3.2 EDUCATION AND ANTENATAL CARE SERVICES

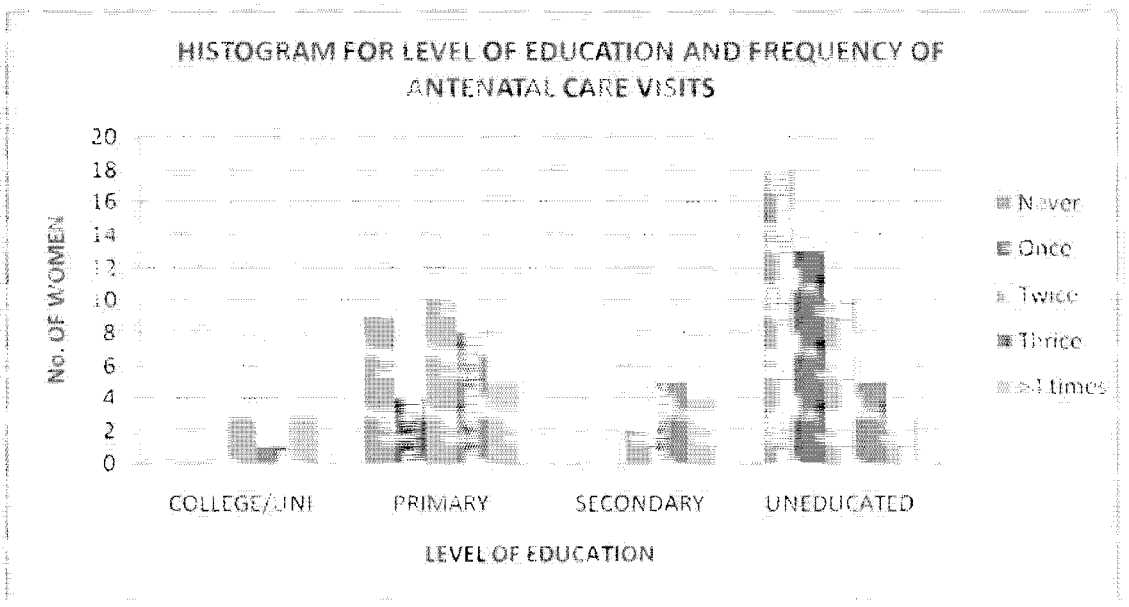
The respondents who had not registered for antenatal care (ANC) were either uneducated or had only primary education. The proportion of those who had registered for antenatal care ranged across the educational status; 31 of the respondents who registered were uneducated (40.79%), 27 attended primary school (35.53%), 11 attended secondary school (14.47%), and 7 attended college/ university (9.21%). In looking at the percentage proportions, it was noted that all the respondents who attended secondary and college/ university levels of education had registered for antenatal care, showing a positive co-relation between educational attainment and registration for antenatal care (see figure below). When asked, peer-interaction was identified as contributory to this.

Figure9



It would be improper to assume that a high rate of initial registration for antenatal care amongst the respondents would be relative to their compliance e.g. of the 49 respondents who were uneducated, 31 of them (approximately 63.3%) had registered for antenatal care; hence the frequency of antenatal care visits by the respondents over time was assessed (figure 8).

Figure 10



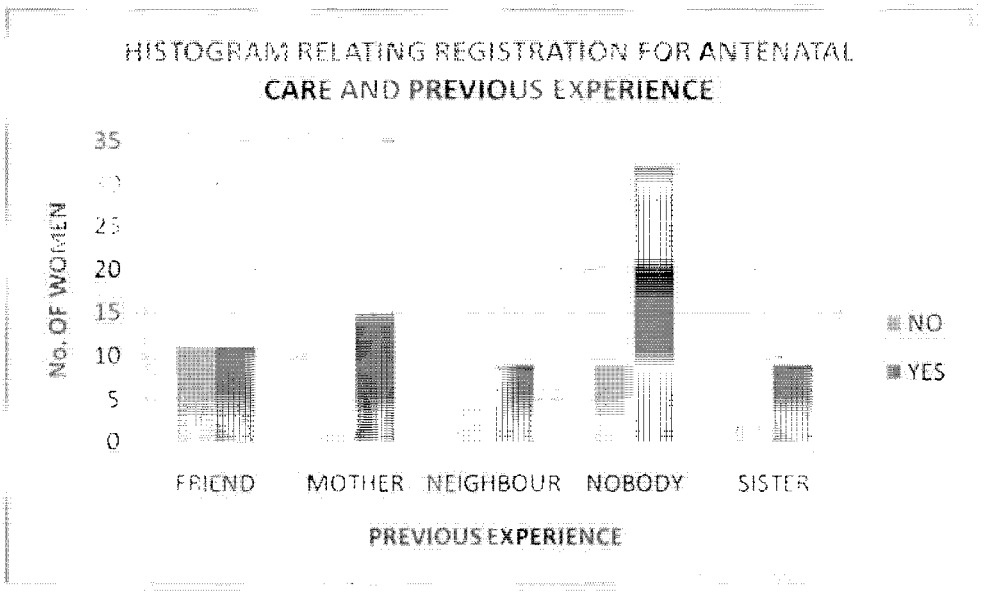
Observing Figure 10 above, none of the respondents who attended secondary school or college/ university had failed to register for antenatal care or attended only once, denoting their understanding of its advantages. A large proportion of the respondents who were uneducated or had attended primary school had never attended ANC (18 uneducated and 7 primary level respondents respectively). While 13 of the uneducated and 4 of the primary level respondents had attended antenatal care only once, there were no recorded once-only visits by the respondents with higher educational attainment. 25 of the respondents had made two antenatal care visits; including 10 uneducated, 10 primary level, 2 secondary level and 3college/ university level respondents. 19 of the respondents had made three antenatal care visits, and only 15 respondents had made four or more antenatal care visits during their pregnancy.

In summary, 27 of the 103 respondents (26.21%) had never registered or attended antenatal care visits before. 17 had attended once (16.50%), 25 attended twice (24.27%), 19 attended thrice (18.43%) and 15 made four or more visits (14.56%) showing a characteristic decline after the second ANC visit.

4.1.4 PREVIOUS EXPERIENCE ON PRE-ECLAMPSIA

With reference to determining if these respondents had previously had experience on the issue of pre-eclampsia from either their friends and families or none at all, and if that would affect their decision to register for antenatal care, analysis was carried out.

Figure 11



From the data obtained, majority of the women (n=41, 39.81%) had no previous experience on pre-eclampsia, but two-thirds of them had registered for antenatal care. 22 of the respondents (21.36%) had experienced pre-eclampsia through their friends, 13 through their neighbours (12.62%), 11 from their sisters (10.68%) and 16 from their mothers (15.53%). Notable from this was that 94% (15 out of 16 respondents) of those who had experienced pre-eclampsia through their mothers had subsequently registered for antenatal care. The respondents reported that they trusted the **mother-to-child** channel of communication because mothers always act in their best interest.

4.1.5 HEALTH INFORMATION RECEIVED

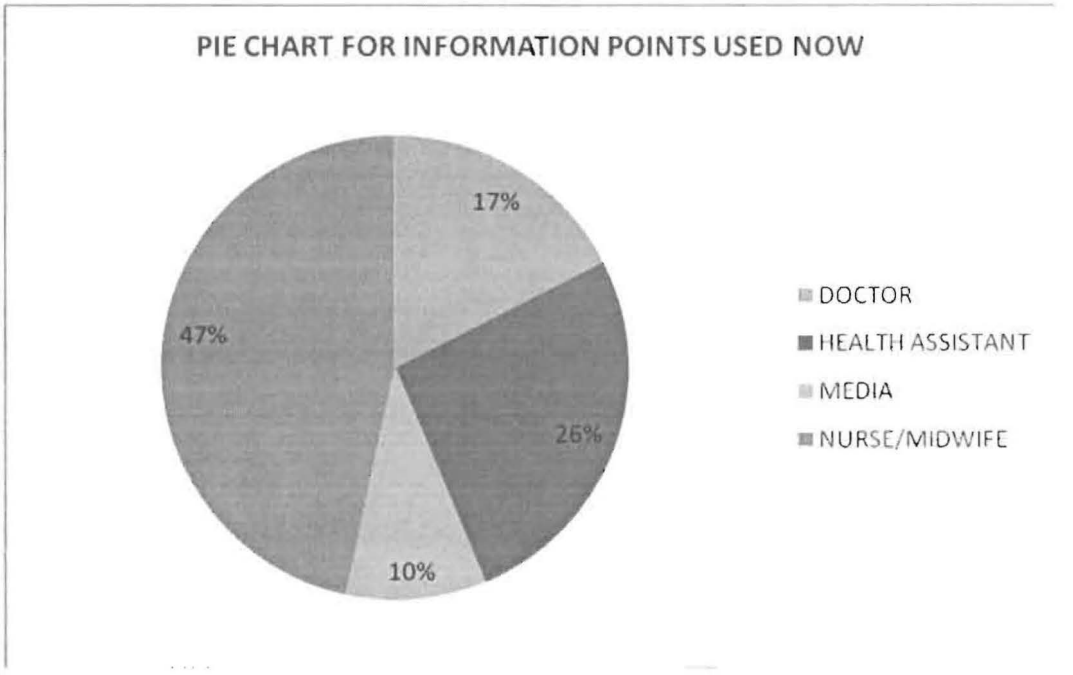
Evaluation about the health information received by the women on the subject of pre-eclampsia was carried out. Indices like the information points where the women source for health information, points where these women would prefer to receive such health information, and if such information are helpful towards preventing the incidence of pre-eclampsia amongst women were utilised to obtain concise data.

4.1.5.1 INFORMATION POINTS BEING USED

It was noted that majority of the respondents (47%) obtain health information about diseases including pre-eclampsia from their Nurses and midwives as they are first-line workers

encountered during antenatal visits, followed by the health assistants (26%) who make up the bulk of the healthcare staff in many rural areas (note figure 12).

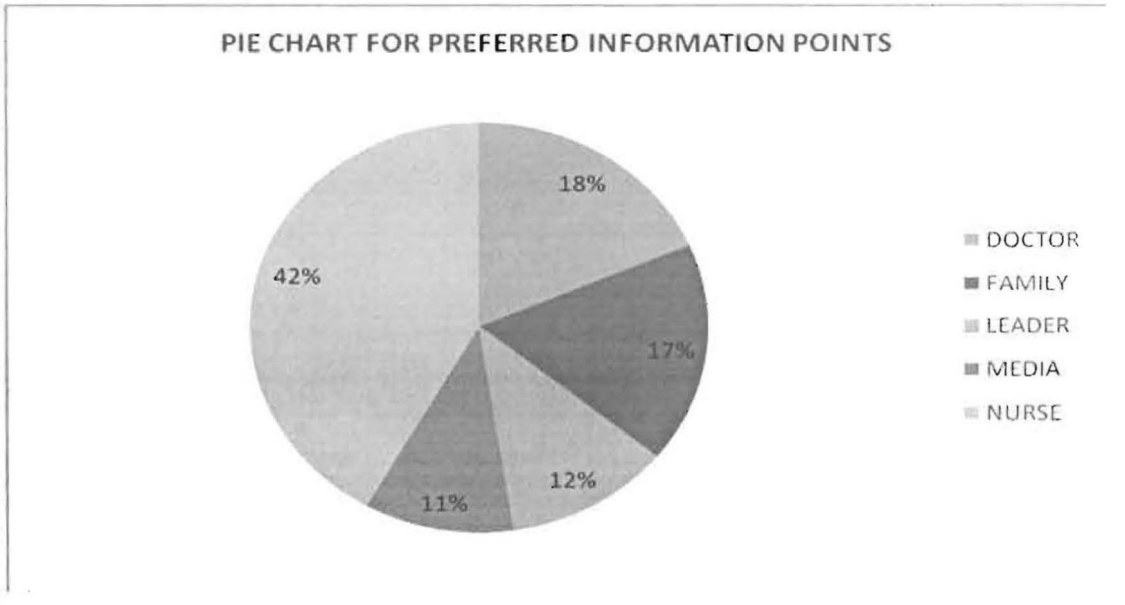
Figure 12



Sadly, 17% obtain information from Doctors due to the difficulty in accessing them, and 10% through various media sources. Radio is the most common media source of relaying health messages in rural communities.

4.1.5.2 PREFERRED INFORMATION POINTS

Figure 13



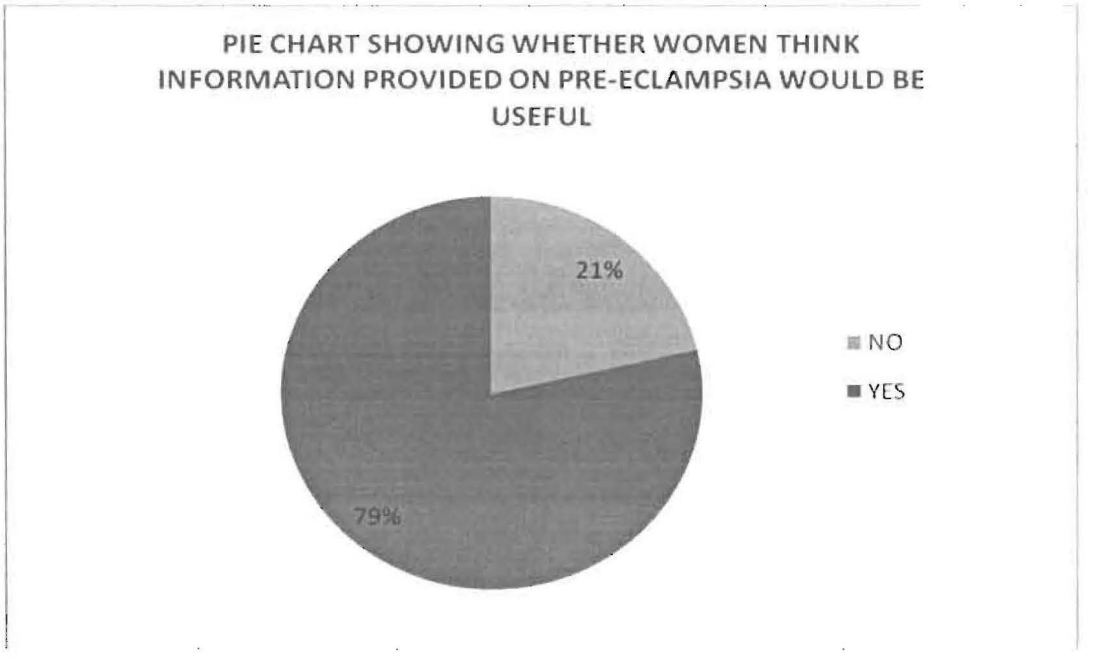
Assessing the sources of health information which the patients would most likely prefer could have positive impacts on how they imbibe future health information and promote their health-seeking patterns; hence this was undertaken (figure 13 above)

The most preferable means of obtaining information about reproductive health was reportedly from the nurses/ midwives. Results of the analysis show that 42% of the respondents would prefer to obtain health information from their Nurse/ midwife, 18% would rather a Doctor, 17% from their family member, 12% from their religious leader and 11% prefer media sources of information. Respondents stated they felt more comfortable with nurses/midwives, and that they were easily accessible. This demonstrates that increased access to nurses/ midwives must be implemented and people of influence like family members and religious leaders should be embedded in strategies towards mitigating incidences of pre-eclampsia in the country.

4.1.5.3 USEFULNESS OF HEALTH INFORMATION

Despite obtaining health information with regards to pre-eclampsia, the researcher tried to note if these patients believe that these information were relevant to them, and could enable them make informed choices on their health.

Figure 14



From the pie-chart above, 79% of the respondents believe that such health information obtained from valuable sources would be useful to them, hence supporting the idea that tailor-made information which would educate them while improving awareness on pre-eclampsia, are needed. Only 21% of the respondents stated that the health information obtained will not make a difference on their health outcome.

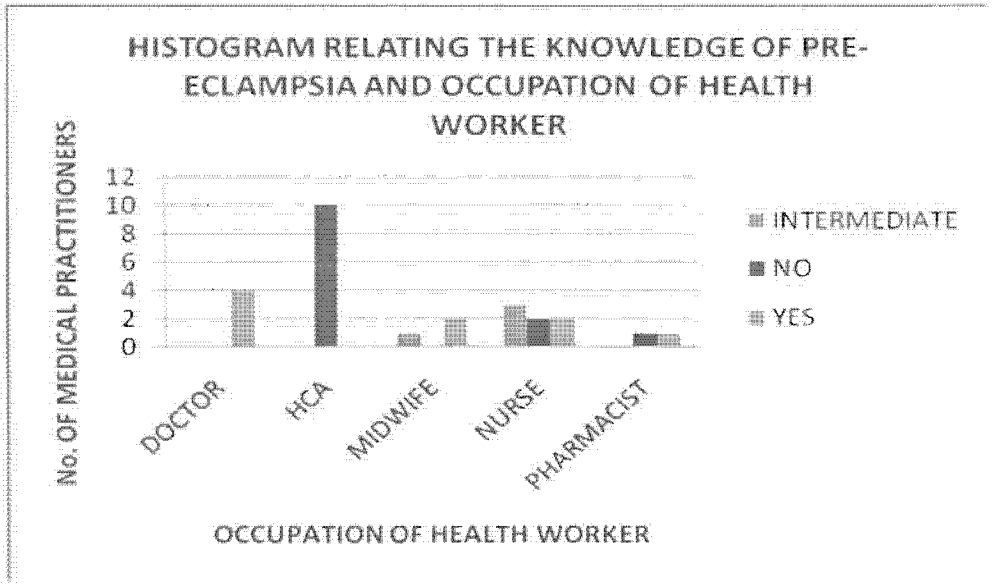
B) HEALTH WORKERS

4.1.6 RESPONDENTS EVALUATION OF KNOWLEDGE

This study utilized a two-type questionnaire (for pregnant women and for healthcare workers) and this section deals with analysing the data obtained from the questionnaires distributed to the healthcare workers who participated in the study.

4.1.6.1 HEALTH WORKERS KNOWLEDGE OF PRE-ECLAMPSIA

Figure 15

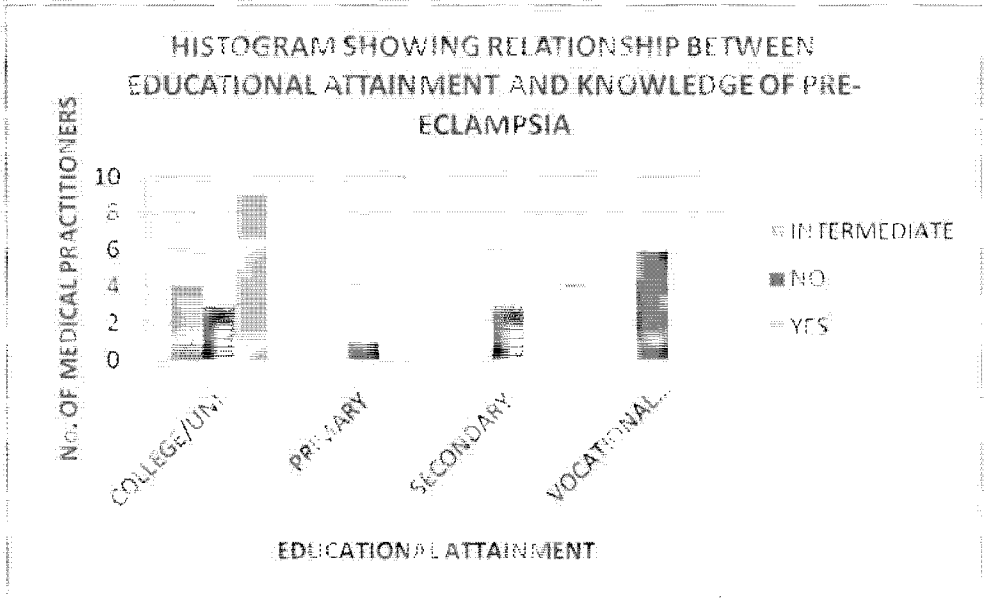


The knowledge of health workers about the issue of pre-eclampsia, using pointers like its symptoms, duration it occurs, its fatality, and communicability amongst others were assessed among the varying health occupation categories. Findings showed that all respondents who were health care assistants had no knowledge about pre-eclampsia.

However, all the Doctors (n=4) had standard knowledge of pre-eclampsia. Only half of the respondents who were pharmacists had standard knowledge about pre-eclampsia, the rest did not. This could be due to their limited knowledge about obstetrics. The level of knowledge about pre-eclampsia varied between intermediate and standard knowledge amongst the respondents who were midwives (see figure 15 above).

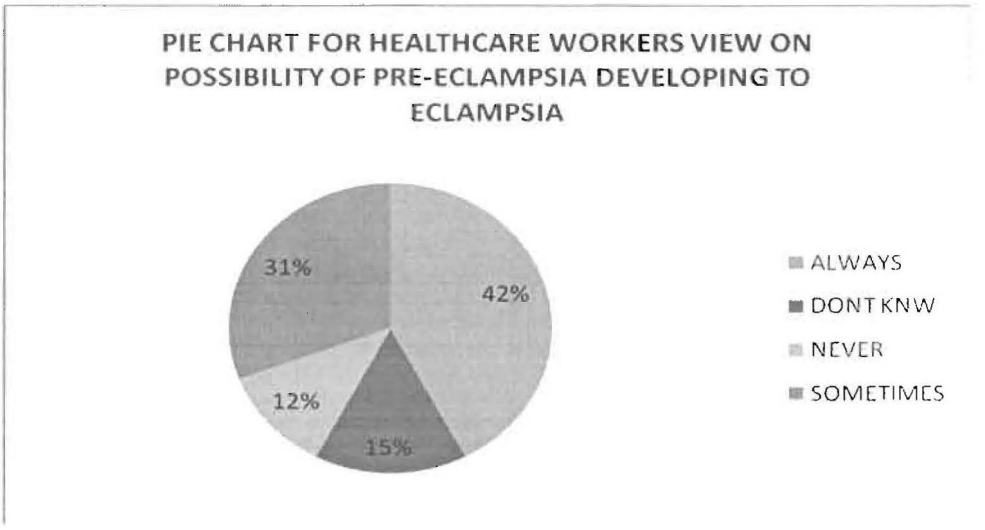
While none of the respondents who were midwives had inexistent knowledge about pre-eclampsia, two respondents who were nurses had no standard knowledge. The health care assistants make up the bulk of healthcare workforce; their lack of absolute knowledge about pre-eclampsia would evidently have detrimental effects on maternal health.

Figure 16



All the health workers with standard knowledge on pre-eclampsia had attained college/ university education (figure 16 above). This unarguably, is due to the level of training received. It was pertinent to note the amount of respondents (health workers) who had an understanding of whether pre-eclampsia could result in eclampsia if not properly managed (see figure 17).

Figure 17

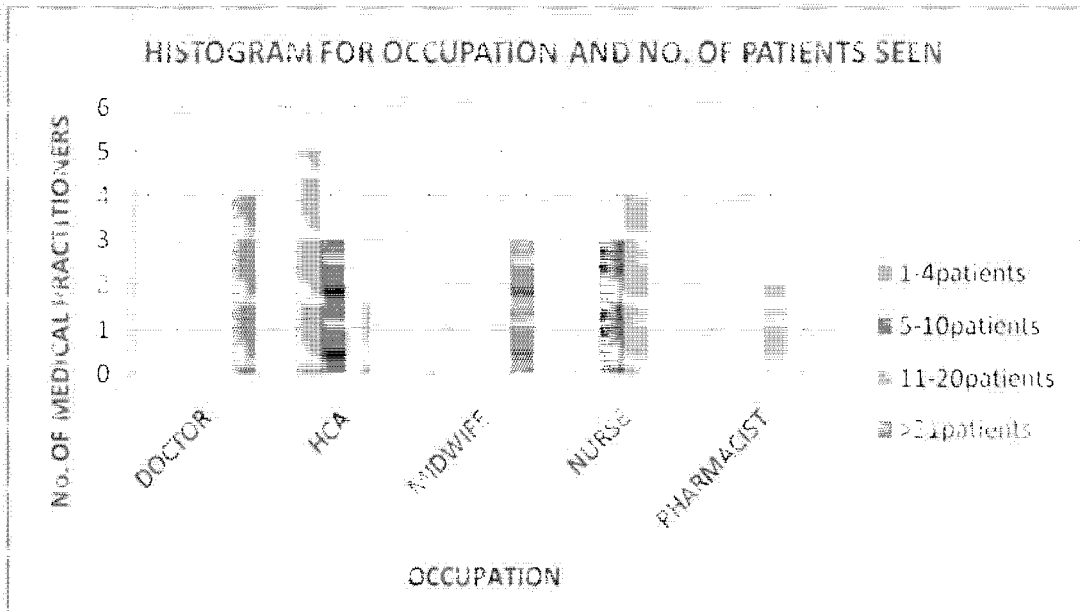


While 42% of the health workers who participated in this study believe pre-eclampsia always develops to eclampsia, 31% of them believe it sometimes develops to eclampsia. It is rather suprising to note that 15% of the respondents do not know if such progression occurs, and 12% believe pre-eclampsia never develops to eclampsia. The latter group have little knowledge about the progression of pre-eclampsia, and this may mar their ideology on the severity of this disease if not properly managed, thus exposing their patients to poor and ineffective management.

4.1.7 OCCUPATION AND PREVIOUS EXPERIENCE OF PRE-ECLAMPSIA

The health occupation of the respondents could enable them attend to more patients with pre-eclampsia over time; this may have an effect on their knowledge and experience of the disease condition.

Figure 18

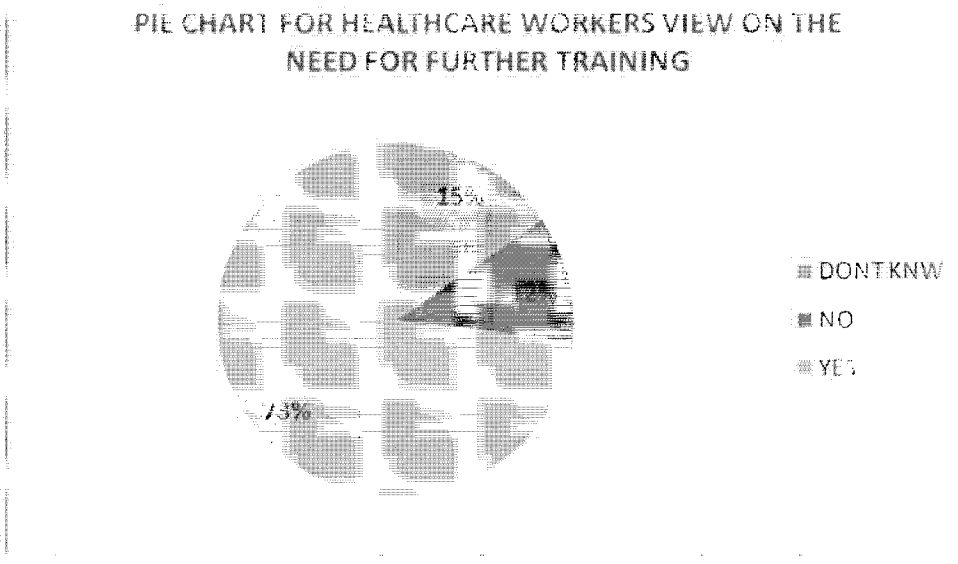


Evidently, all the respondents who were doctors (n=4) had consulted more than 21 patients with pre-eclampsia in the past year, possibly impacting on how they manage and care for such patients. This also implies to all the respondents who were midwives (n=3) as they had attended to over 21 patients in the past year. Majority of healthcare assistants have only attended to between 1-4 patients (n=5), ranging up to 11-20 patients (n=2) in the past year, but not more. The nurses attended to between 5-10 and 11-20 patients in the past year but not more, while only two respondents who were pharmacists (50%) had come across 11-20 patients in the past year and not more or less. It is evident to note that the health workers who have seen more patients with pre-eclampsia tend to have improved grasp about the clinical condition, thus developing their ability to manage the patients.

4.1.8 FURTHER TRAINING

From the questionnaires distributed to the health workers, they were asked about their perception on the need for further training of health workers on the subject of pre-eclampsia.

Figure 19



Approximately three-thirds of the health workers (73%) support the need for further training of health workers if positive changes are required for improving maternal reproductive health and reducing mortality due to pre-eclampsia. Respondents stated that routine training on modern methods in detecting and managing pre-eclamptic patients is important. However, 12% do not see a need for further training of health workers and are against it, as they believe they already have concise knowledge and skills.

4.2 QUANTITATIVE FINDINGS

Respondents were questioned independently on their views on pre-eclampsia and antenatal care services given to women in the Nigerian society. The main findings were segregated into themes namely **Knowledge of pre-eclampsia, Prevention in women, Antenatal care, and Future of ANC in preventing pre-eclampsia.**

4.2.1 KNOWLEDGE OF PRE-ECLAMPSIA

The five respondents who partook in the questionnaire based interview in the study were drawn to discuss about what they considered pre-eclampsia to be. Some of the respondents (TBA's) interviewed viewed pre-eclampsia as a form of internal poisoning (medically known

as toxaemia) which the unborn child exposes the mother to. They believe that it occurs in any woman, irrespective of her socioeconomic class, age group or beliefs.

"I think the unborn child causes a change in the mother, as it is a foreign body, and she struggles daily to balance this and please both the foetus and herself"

A respondent was of the opinion that Pre-eclampsia could be viewed as an auto-immune disorder affecting women during the last stages of their pregnancy, and can have harmful effects on the unborn child. In all, the respondents all believe that there is limited knowledge about the complete understanding of the disease condition and this has hampered progression in tackling it, supporting evidence from the questionnaire findings.

According to the themes looking at the management of pre-eclampsia, the traditional birth attendants feel that immediate delivery is the key and there are few other measures in managing the patient; these may include bed rest. The respondents who were from the Non governmental agencies believe that routine antenatal care visits should be made, and at early stages during a woman's pregnancy. They also agreed with the ideas based on the World Health Organization's guidelines for antenatal care of normal pregnancies, that the women should undertake four or more visits and the timing of the visits must be early in pregnancy (WHO, 2001).

On further discussion, some participants stated factors which were identified as barriers in effectively managing pre-eclampsia in most hospital settings and community clinics were attributed to lack of essential drugs, absence of valuable drugs like Magnesium sulphate from the Ministry of Health's essential drug list provided to hospitals and insufficiently skilled health workforce. They also concluded that women are not properly educated on issues concerning their health; hence they end up visiting the hospitals when pregnancy complications or an emergency arises. This may be too late and the results demoralising.

"*We lack the manpower, drugs and basic amenities like electricity, storage and transportation system for emergencies. These patients do not die due to our lack of vital knowledge about pre-eclampsia or pregnancy-related complications, but due to our carelessness and lack of effort by relevant stakeholders*"

The concern of the stakeholders lies in the fact that they believe their knowledge is quite good to manage pre-eclampsia, but constraints on ground (poor infrastructure and support) is preventing them from effectively achieving their goals of reducing maternal mortality.

4.2.2 PREVENTION

Under this theme, respondents mentioned certain factors they believed were useful in preventing pre-eclampsia. While some believe adequate education of community women on the benefits of antenatal care visits could mitigate problems arising in pre-eclampsia, the TBA respondents feel that healthy diets and avoidance of occult/ spiritual attacks from the enemies can help prevent pre-eclampsia. This expresses the varied contrast with which pre-eclampsia is viewed within the society. The only respondent from the Local government council strongly believe that interventions to prevent the incidences of pre-eclampsia must be tailor-made with attention placed on the characteristics of each community in question, so as to improve the effectiveness of such interventions.

" *..Providing health information through leaflets in local dialects, use of town criers, community and religious leaders, radio adverts and jingles are applicable strategies which can improve advocacy on pre-eclampsia from grassroots to upper-class levels*"

Most of the respondents are of the opinion that when pre-eclampsia is properly managed using anti-hypertensive and anti-epileptic drugs depending on the severity of the condition (see table in Appendix 7), this can prevent the development of full eclampsia in pregnant women. The traditional birth attendants feel that they should be incorporated in the healthcare hierarchy, and educated on standard procedures in managing maternal complications as they have unaccounted visitations from quite a number of pregnant women in the rural areas.

4.2.3 RELEVANCE OF ANTENATAL CARE

Most of the respondents agree that antenatal care is of great relevance in preventing pregnancy-induced complications. They reveal that majority of antenatal care in Nigeria are

delivered by Midwives, nurses or lower level health workers (locally known as community health extension workers).

"*Health care workers serve a great deal in healthcare settings in Nigeria, especially the rural areas, as there is a shortage of high-level workers like Doctors in deprived areas. The underlying problem is their competency and grasp of understanding of these disease conditions*"

Some respondents also argued that priority was placed on the least important elements like measurement of weight and blood pressure, with less emphasis placed on important measures like blood and urine testing.

"*...The pregnant women are usually informed that pregnancy is a thing of joy, and they are blind-folded from the imminent dangers they could be exposed to. Hence, they do not take antenatal visits seriously as they see no reason to. They avoid routine visits and are caught by surprise when complications arise. This may be too late*"

Another theme also looked at the use and misuse of antenatal care. Some respondents pointed out that there have been missed opportunities with reduced antenatal visits by the pregnant women. Such opportunities may include educating these women on the complications of pregnancies, prevention of diseases like malaria, tuberculosis and HIV/ AIDS, improvement of mother's nutritional status, immunization of tetanus toxoid as well as advice on steps to take for a safer pregnancy and childbirth.

There is a deep-rooted need to incorporate traditional birth attendants (TBA's) and Healthcare assistants/ auxiliary workers in strategies involving maternal reproductive care, ensuring they are duly trained regularly and well appreciated as concluded by the respondents. It is pertinent to note that this clan of people make up a large fraction of the healthcare team in Nigeria especially in the rural areas; due to the socioeconomic levels of these women as well as the longstanding traditional beliefs, these traditional birth attendants are the next port of call when these women require reproductive care (NDHS, 2004).

Most respondents do not believe that the quality of antenatal care services being offered to women especially in the hospitals/ clinics within the rural areas are up-to-standard. The respondents from the NGO view that protocols which should ensure that the same quality of

standards of antenatal care must be implemented in all healthcare facilities across the country; such care must be void of inequalities. When the respondents were informed of the standard **WHO antenatal care model** (See Appendix 2) and the **basic component checklist** (See Appendix 9) which determines the pathway for which pregnant women would be cared for depending on the presentation of any complications, their responses were overwhelming. They viewed the possible implementation of such model as a welcome development which could help control and standardise the level of antenatal care service women from all socioeconomic classes should receive regardless of their geographic location.

4.2.4 FUTURE OF ANTENATAL CARE IN PREVENTING PRE-ECLAMPSIA

The respondents were asked about what they perceive would be beneficial in improving the future of antenatal care in mitigating the morbidity and mortality associated with pre-eclampsia amongst Nigerian women. The respondents from the NGO expressed the importance of merging forces with relevant international organizations.

"*Alliance with International bodies and development partners which support the philosophy of improved reproductive care in developing nations can help exchange ideas and resources, leading to the development of effective strategies and policies that would curb the menace of this maternal health issues in our society*"

Other respondents who are traditional birth attendants feel they must be respected and included as part of the healthcare team. They also feel that the Government needs to support their role in reproductive care by providing incentives like regular training, organizing workshops/ seminars, registration of their members, financial support amongst others if they must improve in providing maternal care to their patients.

"...we need to fully utilize the role of these healthcare assistants. In most hospitals, even when the Doctor is not available, we must always meet one or two healthcare assistants on duty. They are the first contact these patients come across; hence they must be well-trained to deal with day to day complications amongst these patients"

The respondents unilaterally expressed the importance of local participation in improving the awareness and advocacy of pre-eclampsia at community level and beyond. They

acknowledged that co-operation and improved community support of strategies which enlighten the women on the benefits of routine antenatal care, promote their knowledge on dangers of complications in pregnancy, and the provision of support groups and a patient-friendly healthcare team who are well informed of the issue surrounding pre-eclampsia could help mitigate the downfalls of this disease condition amongst Nigerian women.

The responses obtained all pinpoint to the fact that for antenatal care services to be effectively utilised in reducing the incidences of pre-eclampsia in Nigeria, all relevant parties including the Government, health workers, development partners and the general public must work in partnership towards achieving the unique goal of reducing maternal mortality due to pre-eclampsia and other pregnancy-induced complications.

"No single party should be left out, and it is only through this that friction would be reduced as every stakeholder would now have a sense of belonging in making the partnership against maternal mortality effective".

4.3 DISCUSSION

INTRODUCTION

The study was undertaken to evaluate the level of awareness about women in a rural community on the issue of pre-eclampsia and its management. Findings were obtained on concluding the study and this segment reviews these findings in line with relevant literature to note relationships.

KNOWLEDGE AND PREVENTION OF PRE-ECLAMPSIA

This cross-sectional study revealed that community awareness about the subject of pre-eclampsia was inadequate in the district. The healthcare workers who mainly comprise of Healthcare assistants had **limited knowledge** about pre-eclampsia. None of the healthcare assistants who participated in the study (n=10) had any knowledge about pre-eclampsia, indicating poor knowledge base among healthcare workers about this condition, as earlier reported by Ujah et al (2005). This also affects prevention strategies as identified in the ACCESS (2008) report. Some respondents stated that they lacked faith in judgements made by health workers, as they presumed they were incompetent in managing complications.

Most cases of hypertension in pregnancy and proteinuria are detected early using simple instruments like stethoscope, sphygmomanometer and urine albumin test. Field observation noted that the majority of subunits within the General hospital **lacked** these tools; the only one in the Antenatal care ward regularly broke down, or gave inaccurate readings over time. With regards to the urine protein test, respondents noted that they had to purchase or come along with their kit; otherwise, no readings would be obtained and this constrains early detection. **Systematic errors** in routine blood pressure and proteinuria measurement were also identified among health workers. Urassa et al (2003) reported that medically, proteinuria is usually confirmed using 24-hour quantitative protein in urine collection, but this was not being practiced.

LEVEL OF EDUCATION AND SKILLS BASE

Most healthcare assistants only attained vocational training, and there was notable shortage of experienced and qualified skilled care providers in the study population, a low-income area. Skills on managing pre-eclampsia also differed amongst nurses and pharmacists, supporting observations by Lawoyin et al (2007) that majority of Nigerian health professionals do not have effective knowledge outside their skills base. Therefore, routine training and follow-up sessions need to be conducted with health workers, especially healthcare assistants so they are embedded in the healthcare delivery system for improved patient care. Okere (2008) noted that the quality of antenatal care received plays vital roles in reducing maternal mortality. There has been **low reliability on the use of ANC services** with regards to predicting and managing obstetric complications as demonstrated in developing nations (WHO, 2003). Results from this study support those from previous studies that issues surrounding repeated ANC visits, content of ANC given, attitudes of healthcare workers to patients, improved communication and feedback of test results to patients, and promoting drug compliance should be reviewed and further evaluated to obtain positive feedbacks (Kabir et al, 2005; Ujah et al, 2005; Igberase, 2007).

COMMUNITY AWARENESS OF PRE-ECLAMPSIA

Due to the relatively **low educational status** of study participants in this rural setting (almost 50% are uneducated), their general knowledge of pre-eclampsia was **notably poor** as only

10% of the uneducated women had knowledge about pre-eclampsia. A progressive improvement in knowledge was noted as the participants varied from primary to college/university educational levels (see figure 3). The importance of **community awareness and advocacy** about pre-eclampsia is pertinent as three-quarter of the respondents also had relatively no knowledge of the symptoms of pre-eclampsia (see figure 6). This further re-affirms the recommendation by USAID (2008) on the need for community mobilisation in improving maternal health outcomes. This study highlighted the use of ANC services within the rural setting where **two-thirds** of the respondents had initially registered for ANC regardless of their parity. The respondents who were within the 15-24 and 25-34 age groups also had a **higher turnover** of initial registration; they stated their deep concern about their health was responsible for this.

ANTENATAL CARE USAGE

The WHO model of antenatal care noted that women without risk factors requiring special care should have at least **4 standard ANC visits**; while those requiring special care should be booked for more visits (WHO, 2001). This study revealed that about 20% of the participants who had registered for ANC (n=76) had attended the required four visits while a majority 33% had attended only two ANC visits. The number of visits declined after the 2nd visit. This could be due to the perception the women received on previous visits that there was literally nothing to worry about during pregnancy; hence they saw no need of wasting limited resources in subsequent attendance until they were due for delivery. The respondents who had attained minimum of secondary school and above had all registered for ANC in comparison with the uneducated/ primary level respondents.

This further supports the WHO (2003) observation that **increased enlightenment** promotes awareness about maternal health issues thus improving ANC registration. Approximately 40% of the respondents revealed no pre-eclamptic experience, but two-thirds of them had registered for ANC. Respondents **whose mothers had been affected** by pre-eclampsia showed a 90% chance of registering for ANC than if their other family members/ friends were affected, revealing a communication channel effective in relaying health messages. This observation can be utilised when developing health strategies.

HEALTH INFORMATION

Responses from the women on the **sources of health information** showed that almost half of the respondents obtained such information from their nurses/ midwives. One-quarter of them also received this information from healthcare assistants; it was initially observed that these healthcare assistants had little or no concise knowledge about pre-eclampsia. Ironically, the quality of health information about pre-eclampsia and benefits of routine ANC given to the pregnant women by the healthcare assistants, as part of the healthcare team, was notably poor. More should be done to improving their standard of knowledge and grasp about reproductive health issues if they must function effectively as part of the nation's healthcare team. This approach should also be provided to Traditional birth attendants as a 2001 study by Akinfolayan et al reported that 80.8% of traditional birth attendants evaluated did not consider any woman to be at high-risk during pregnancy, revealing their lack of knowledge about complications in pregnancy.

Nurses were also identified as the **preferred source of information** for 40% of the respondents and one-fifth of respondents would prefer either their Doctor or family member as sources of health information. The nurses and midwives make up a substantial proportion of the nation's reproductive health force (NDHS, 2004). In areas with deep-rooted religious concerns as the study location, the use of religious leaders as a channel for providing health information should not be underestimated (12% of the study respondents prefer them as information points). Approximately 80% of the respondents said the information provided with regards to pre-eclampsia would be useful to them; noting a low-level of resistance to accepting such life-saving cost effective intervention by the community.

DRAWBACKS ON PROMOTING PRE-ECLAMPSIA AWARENESS

The study has highlighted possible **drawbacks** on the level of knowledge and awareness about pre-eclampsia within a community in a developing nation. Inadequate knowledge of pre-eclampsia by pregnant women and healthcare workers, poor screening facilities and reliability of diagnostic measurements, weak referral systems, poor utilization and content of ANC services (Urassa et al, 2003), inadequate training and use of healthcare assistants and Traditional birth attendants, and low motivational levels of healthcare workers are major problems requiring urgent attention if incidences of pre-eclampsia within this nation must be mitigated (UNICEF, 2007). Akinfolayan et al (2001) observed that 46.2% of traditional birth

attendants never refer pregnant patients with complication, supporting interview findings that they lack vital knowledge about its importance. Review of literature and results drawn from the study revealed the **knowledge gap** among pregnant women and health workers on the issue of pre-eclampsia; the need for increased awareness on pre-eclampsia from grassroots level, and improved ANC services in health facilities must be evaluated especially amongst women resident in low-income rural areas.

A 1997 landmark study in Kebbi state, Nigeria on using community education in encouraging use of emergency obstetric services conducted by Hassan et al using quantitative and qualitative methods however concluded that only increased community awareness of obstetric complication have failed to instigate care-seeking behaviour, hence other strategies must be implemented to tackle this limitation (Hassan et al, 1997). This study also pointed out that only 28% of the respondents who had registered for ANC had adept knowledge about pre-eclampsia, and this can be linked to the poor knowledge of the healthcare providers especially the healthcare assistants who these patients are more in contact with.

In summary, results from this study denote an increase in antenatal care visits and use of reproductive health services for respondents with improved knowledge about pre-eclampsia. Therefore, it is crucial that a combination of efforts and resources, besides community awareness, must be encouraged for the incidence of pre-eclampsia to be alleviated in Nigeria.

4.4 RECOMMENDATION

After careful examination of the results of this study, the researcher is convinced that the following recommendations would be useful to all relevant stakeholders in curbing the menace of pre-eclampsia in this nation:

- That there must be increased antenatal care coverage and limited missed visits across the nation especially in rural areas and the quality of obstetric health services must be improved. *Investment by Ministry of Health at all levels in mass media campaigns promoting benefits of early Antenatal care enrolment and reduced missed visits.*
- That each member of the healthcare team (especially the nurses/ midwives who are preferred health information points) must be properly educated about detecting and managing pre-eclampsia in Nigerian women, as well as other reproductive health issues; this information must be effectively communicated to the patients. *Routine training*

programs organised by the Ministry of Health and Development partners with experts within the field of maternal health, in-line with allocated training budgets.

- That there must be continuous routine training program to scale-up the knowledge of healthcare assistants and traditional birth attendants who make up a large proportion of reproductive health providers in the rural areas (NDHS, 2004). They must also be effectively included in obstetric care programs, encouraging stronger partnership with other healthcare units and improved referral systems. *This can be done through combined resources by Federal/ state governments and Development partners who support local initiatives.*
- That a community action and mobilisation strategy must be implemented to increase the use of antenatal care services and promote healthy maternal behaviour (see Appendix 10). *Concerted efforts by the Government, its related ministries and relevant stakeholders are required to implement this, as partnerships can augment costs.*
- That community knowledge on pre-eclampsia, post-partum haemorrhage and care during and after pregnancy must be encouraged (ACCESS, 2008). *Stronger Partnership with local councils, village heads, religious leaders, community-based organisations, and State Ministry of Health to promote advocacy and awareness using localised media tools and enlightenment programs.*
- Other effective channels of communication like use of mother-to daughters and religious leaders in low-income and culturally sensitive areas must be accessed to promote healthy maternal behaviour (as noted in this study). *Equipping Public Health Units in communities with educational materials and skills training to educate the women and leaders.*
- Preventive activities like encouraging bed rest, use of calcium supplements and low-dose aspirin in reducing prevalence of hypertension, and routine/ early use of ANC are appropriate for low-income areas and should be supported (WHO, 2001; Urassa et al, 2003). Also increased pre-natal care including giving folic acid tablets should be encouraged (USAID, 2008). *Provision of medical supplies and equipments to all health providers by Ministry of health and Medical stores department.*
- That the use of Magnesium sulphate which is very effective in managing pre-eclampsia and preventing eclamptic seizures should be included in hospital formularies across the nation (Gardner, 2005). *The Ministry of health should consider embracing this life-saving regimen which saves cost due to unwanted hospitalization and continuous use of ineffective drugs.*

- The implementation of the WHO antenatal care model (see Appendix 2) in the maternal health policy in a manner bespoke for rural areas should be undertaken. Also the WHO basic component checklist form (see Appendix 9) ensuring quality standard of care is given to women during antenatal must be introduced to curtail shortcomings. *Ministry of health needs to design and enforce policies in line with this recommendation; a cost-effective strategy analysed by WHO (2001)*
- Need for an effective and efficient referral system linking all levels of healthcare which is patient-friendly and inexpensive, thus reducing the rates of maternal mortality (COMPASS, 2007b). The use of a classification form (see Appendix 3) that determines if women require routine ANC or specialised care should be mandated. *Provision of funds by Federal government for purchase of vehicles and communication materials, as well as adequate health staff training on emergency treatment patterns. A cost-effective measure in the long-run.*
- That the issue of long waiting times and poor feedback patterns to these patients must be countered if they are to be encouraged to make regular hospital visits for ANC. An improved patient-centred environment must be encouraged. *Improvement of knowledge and counselling skills base of health workers must be routinely undertaken.*

The long-term cost-effectiveness of these recommendations overshadows their implementation costs. Implementation of these recommendations would hopefully contribute to reducing the incidence and prevalence of pre-eclampsia amongst Nigerian women, especially those residing in rural areas.

CHAPTER 5

CONCLUSION

5.0 CONCLUSION

The issue of pre-eclampsia is a grave one which requires urgent attention to mitigate its effect on the reproductive health of Nigerian women. Despite the initial registration for antenatal care by women resident in the rural areas, the high drop-out rates and poor performance of antenatal care in managing and educating the women on the issue of pre-eclampsia draws attention on the fact that preventive measures could be appropriate especially in low-income settings. The need for improved community awareness and mobilisation on the subject of pre-eclampsia and cost-effective alternatives for managing pre-eclampsia must be reviewed and implemented accordingly (See Appendix 10), as this model has been proven to be effective in other countries (USAID, 2008).

Results from previous studies have shown that increased public awareness of danger signs and the need for referrals for cases of pre-eclampsia and eclampsia, as well as improved communication skills between healthcare workers and patients positively contributes to reduction in mortality from this health condition (Dolea et al, 2003; Urassa et al, 2003; Gardner, 2005). Treatments in Nigeria is still dependent on bed rest, use of anti-hypertensive and anti-convulsants and in extreme situations, delivering the infant. The problems of availability, accessibility, coverage and quality of care all limit the potential gains of Antenatal care services in Nigeria.

This study achieved its set objectives by reviewing the community's level of knowledge and awareness of pre-eclampsia; profound lapses were identified. Practical limitations which

prevent quality maternal care and use of antenatal services in a rural region of Nigeria have been highlighted. Poor levels of awareness of this health condition amongst pregnant women, poor knowledge base of the healthcare workers about this disease condition, limited routine use and accessibility of antenatal care, quality of the content of care received, poor accessibility to preferred health information points, dilapidated state of obstetric services and inefficient referral systems amongst others are important issues which need to be addressed if the problem of pre-eclampsia is to be tackled effectively mostly in Rural Nigeria.

Greater efforts are needed to tackle this health menace and its existent problems. Policies, programmes and strategies should go beyond provision of health information, but extend to actively promoting behavioural change especially among women resident in rural areas as they are contributory to the nation's high maternal mortality figures. The concept of care during pregnancy must be well embraced by all women, and access to antenatal services which promote preventive measures should be promoted by the Government and relevant stakeholders.

5.1 LIMITATIONS OF THE STUDY

In this study, there was no evaluation regarding if the ANC services were provided by skilled health provider or not. As only 129 respondents were used in this study, it would be unfair to state that findings could be generalised for all women residing in all rural areas and beyond. This study provides a platform for further research with larger samples of statistical significance. Since cross-sectional survey was used, only a snap-shot of the situation could be provided; differing results could be obtained if another time-frame was selected (Levin, 2006). Also, not much documented research work has been done on the subject of pre-eclampsia in Nigeria; hence literature information was obtained from a wide range of varied sources. Further research could be also undertaken on the factors that determine the motivation of community health workers.

5.2 DISSEMINATION

The findings and recommendations would be made available to the Federal/ State Governments, Policy makers and Public health Units of the Ministry of health. Also they

would be made available to the study participants at the local government council. The study results/findings are intended to be published for wider audience through publications and online journals. This study can also be used as the basis for future research work on this health issue.

5.3 REFLECTION

Primarily, I was faced with the predicament of undertaking this study. Having practiced hospital and community pharmacy spanning two years in a rural area, I noted that the burden of ill-health affecting most people could be prevented by simple interventions which are rather overlooked. In the issue of maternal health, pre-eclampsia is a condition most people including health workers have little grasp about. It has led to the death of thousands, yet remains salient in government strategies.

I was trying to achieve the goal that the community could help prevent pre-eclamptic incidences if they are effectively mobilised, educated and made aware of its imminent dangers.

Also, that most health workers had limited knowledge about it, and could evidently offer little advice to the populace. My observations pointed-out that much emphasis is placed on natural childbirth, but little on complications, hence women are rather unprepared. These women are rather shocked at the inability of health workers to explain the nature of this illness and possible outcomes. Antenatal care which is supposed to help educate women on complications is rather used as a social platform where the women meet to discuss important issues like crops harvested or cows sold. **Pre-eclampsia takes the joy out of childbirth.**

I was faced with varying challenges including social acceptance of this topic, cultural/ religious sensitivity of indigenes, location of study, willingness of health workers to accept limited knowledge, availability of relevant literature/ past research work on this subject within Nigeria for review, conducting interviews with tapes amongst others (this was rejected blatantly). The importance of this study overshadowed them all.

At most times, I wanted to quit, but the kind efforts of my supervisor through my ordeal motivated me. Support from friends and family were of great importance as well. Looking at the level of infrastructure and decadent social amenities at the study location, little wonder

most qualified health workers would refuse to work in these places. Health care assistants are of great importance, as they are always around to deal with patients. The problem is, their levels of training cannot provide quality healthcare these patients deserve; hence improving their skills base should not be overlooked.

I feel fulfilled that I have raised an insight into the level of awareness of women and health workers knowledge about pre-eclampsia. This study has helped me develop skills in undertaking research, and reporting findings as well. It has equipped me with analytical and critical thinking skills. It has provided me with a fresh insight into the issue of pre-eclampsia and other related reproductive health issues plaguing Nigerian women. I only hope the recommendations from this study can be taken upon, and further research work on the issue of pre-eclampsia in rural and urban Nigeria, as well as suitable cost-effective interventions to mitigate its effects can be conducted over time.

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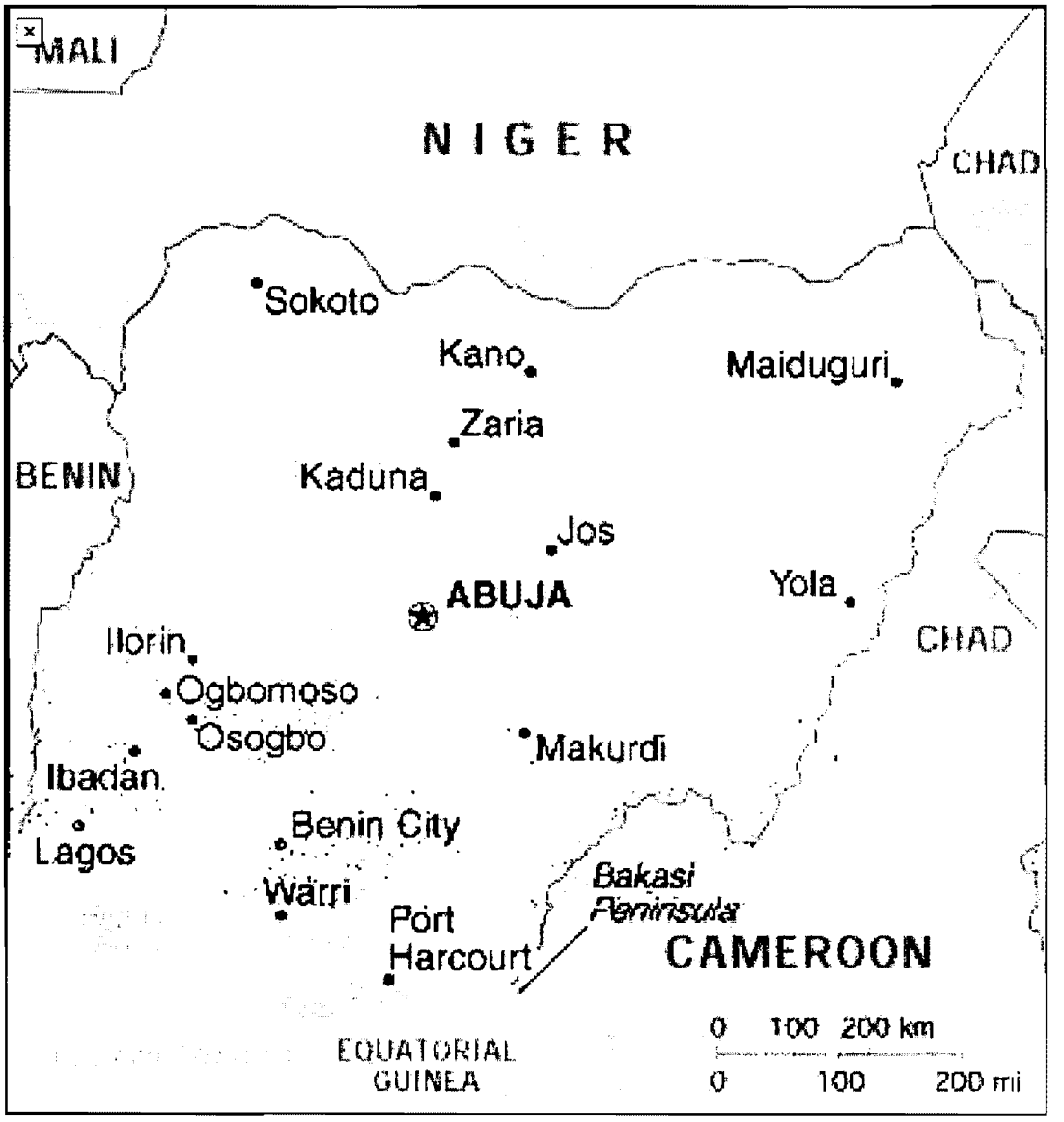
APPENDICES

APPENDIX 1

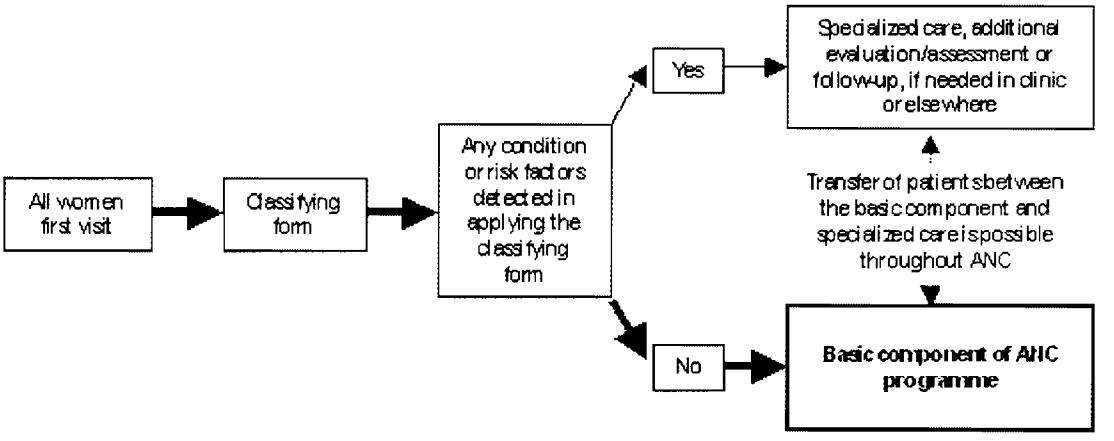
Map of Nigeria, the study country



Source: DFID (2005). Available at:

http://www.dfidhealthrc.org/publications/Country_health/Nigeria.pdf

APPENDIX 2

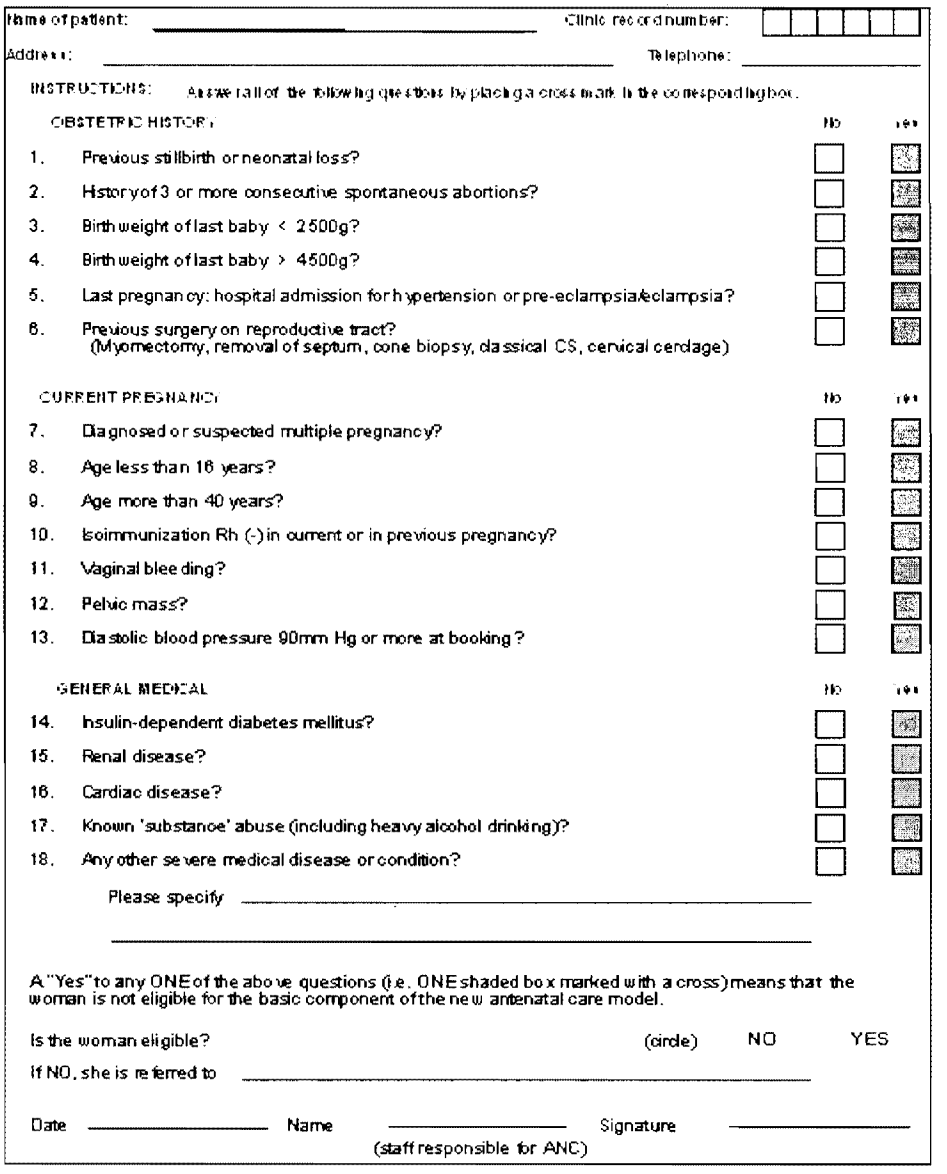


The new WHO antenatal care model

Source: WHO (2008d) WHO antenatal care randomised trial

APPENDIX 3

Classification form which identifies a woman who needs basic routine antenatal care or specialized care based on presence of possible risk factors for complications in pregnancy.



Name of patient: _____ Clinic record number: | | | | | | |

Address: _____ Telephone: _____

INSTRUCTIONS: Answer all of the following questions by placing a cross mark in the corresponding box.

OBSTETRIC HISTORY	No	Yes
1. Previous stillbirth or neonatal loss?	☐	☐
2. History of 3 or more consecutive spontaneous abortions?	☐	☐
3. Birth weight of last baby < 2500g?	☐	☐
4. Birth weight of last baby > 4500g?	☐	☐
5. Last pregnancy: hospital admission for hypertension or pre-eclampsia/eclampsia?	☐	☐
6. Previous surgery on reproductive tract? (Myomectomy, removal of septum, cone biopsy, classical CS, cervical cerclage)	☐	☐

CURRENT PREGNANCY	No	Yes
7. Diagnosed or suspected multiple pregnancy?	☐	☐
8. Age less than 16 years?	☐	☐
9. Age more than 40 years?	☐	☐
10. Isoimmunization Rh (-) in current or in previous pregnancy?	☐	☐
11. Vaginal bleeding?	☐	☐
12. Pelvic mass?	☐	☐
13. Diastolic blood pressure 90mm Hg or more at booking?	☐	☐

GENERAL MEDICAL	No	Yes
14. Insulin-dependent diabetes mellitus?	☐	☐
15. Renal disease?	☐	☐
16. Cardiac disease?	☐	☐
17. Known 'substance' abuse (including heavy alcohol drinking)?	☐	☐
18. Any other severe medical disease or condition?	☐	☐

Please specify _____

_____

A "Yes" to any ONE of the above questions (i.e. ONE shaded box marked with a cross) means that the woman is not eligible for the basic component of the new antenatal care model.

Is the woman eligible? (circle) NO YES

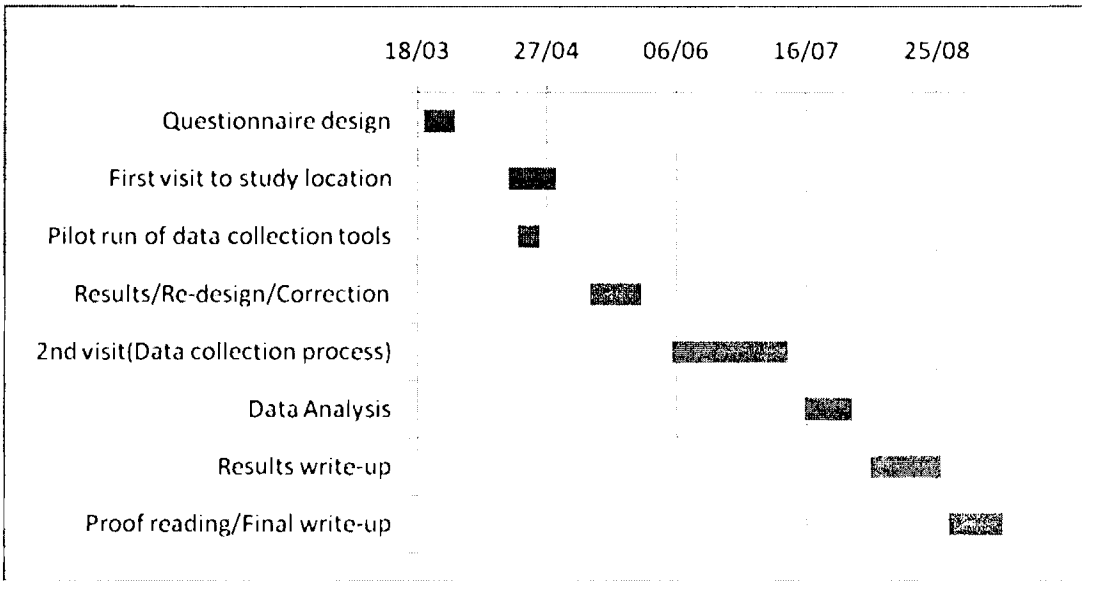
If NO, she is referred to _____

Date _____ Name _____ Signature _____
(staff responsible for ANC)

Source: WHO (2008d) WHO antenatal care randomised trials. Available at: http://www.who.int/reproductivehealth/publications/RHR_01_30/RHR_01_30_chap4.en.html (Accessed 06 August 2008)

APPENDIX 4

Gantt chart of time frame from inception to completion of study.



INCURRED COSTS:

Questionnaires/Printing Works: = £50

Travel to study location (including local travel expenses): £1,500

Research assistant/interpreters for 3 months: £50/month for two = £300

Miscellaneous Expenses: £300

Total expenses: £2150

APPENDIX 5

United Nations Millennium Development goals (MDG) as declared in September 2000

Eradicate extreme poverty and Hunger

-reduce by 50% the proportion of people living on less than a dollar a day

-achieve full productive employment and decent work for all

-reduce by 50% the proportion of people suffering from hunger

Ensure that all boy and girls finish a full course of primary education

Promote gender equality, while empowering the women

-eliminate gender inequality in both primary and secondary education

4) Reduce child mortality

   -reduce by two-thirds the under-five mortality

5) Improve maternal health

   -reduce maternal mortality ratio by three-thirds

   -achieve universal access to reproductive health

Combat HIV/AIDS, Malaria and other diseases

-to stop and begin to reverse the spread of HIV/AIDS

   -by 2010, achieve universal access to treatment for HIV for those who really need it

   -to have stopped and begin to reverse the incidence of Malaria and other diseases

To ensure environmental stability

-integrate principles of sustainable development into policies and programs of countries, while reversing the loss of environmental resources.

-reduce biodiversity loss, while achieving a significant reduction in rate of loss by 2010

-reduce by 50% the proportion of people without sustainable access to safe drinking water and basic sanitation

-achieving significant improvement the lives of at least 100 million slum dwellers by 2020

Develop Global partnership for development

-addressing special needs of least developed countries

-develop an open rule-based, predictable, non-discriminatory trading and accounting system

-deal comprehensively with the debts of developing countries

-develop and implement strategies for decent and productive work for youths, in alliance with developing countries

-provide access to affordable and essential drugs in developing countries, in alliance with pharmaceutical companies

- make available the benefits of new technology especially information and communications, in alliance with the private sector

Source: U.N (2008) A gateway to the U.N. system's work on the MDGs. Available at: http://www.un.org/millenniumgoals/bkgd.shtml

APPENDIX 6

PROFILE OF STUDY COUNTRY

Figure 3: *Nigerian nurses makes up a large fraction of the health workforce in the nation*
SOURCE: Action Aid (2007)

Nigeria is the most populous black nation in Africa, with a teeming population of 144,720,000 and a population growth rate of 2.382% (WHO, 2008). It ranks 9th in the World's total population scale (UN, 2005); and has a Total fertility rate of 5.7 (NPC, 2004). It is the largest supplier of oil in Africa (with an oil reserve of 36.2 billion barrels- The tenth largest in the world) earning most of its national revenue through global crude oil sales. Despite the huge potentials of being one of the richest countries in Africa due to its huge deposits of oil and other natural minerals as well as highly resourceful and skilled citizens, over 70% of the population live on less than US$1 per day (Action Aid, 2007). It is located in Western Africa bordering the Gulf of Guinea (south) with territorial borders at Republic of Benin (west), Cameroon (east), Chad and Niger (north); and occupying a total Area of 923,768 square kilometres. Its lowest point is the Atlantic Ocean at 0m while Chappal Waddi is its highest point at 2,419m (CIA, 2008). The climate is more or less equatorial in the Southern region, tropical in the mid-central region and Arid desert-like in the Northern region. Annual rainfall ranges from 2000 millimetres in the coastal region to about 500-750 millimetres in the North (LOC, 2008). The main religious sects are equally divided into Christianity and Islam which are 45% each while the remaining 10% are Traditional religious followers. The Christians are predominant in the South, while the Muslims reside mainly in the Northern region (Action Aid, 2007b). There are

approximately 250 ethnic groups in Nigeria with the main ones being Igbo, Yoruba and Hausa (LOC, 2008).

The average adult literacy rate is 69.1%, with men (78.2%) having a higher rate than women (60.1%). Even though education is free, it is not compulsory hence a selected population are unperturbed about not attending i.e. the nomads and the disabled clan (LOC, 2008). The rate of enrolment also dropped as they progressed from primary (68% boys, 59% girls) to secondary school (28% boys, 23% girls) and this hampers most development strategies especially as regards child and maternal health and health advocacy/ promotion (LOC, 2008). Approximately 72% urban and 49% of rural residents had access to clean drinking water; 48% urban and 30% rural residents have access to adequate sanitation. This significantly contributes to the poor condition of health and healthcare in the nation (LOC, 2008). Other significant health issues like Tuberculosis (fifth in Africa), Polio (one of four remaining endemic countries), Malaria (2.6 million cases annually), HIV/AIDS (4% prevalence rate) have a significant impact on the welfare of the Nigerian population (LOC, 2008). The healthcare operates an 'out of pocket expenditure' system, unlike the paternistic approach applicable in countries like the U.K; hence access to quality healthcare is dependent on individual's ability to afford. About 70% of the total workforce is employed in Agriculture and fishing sector, hence their welfare is dependent wholly on their generated revenue from sales which constitutes a mere 17.6% of gross domestic product; the industry and manufacturing sector employs just 10% of workforce and constitutes 53.1% of the gross domestic product. Urban unemployment rate is 12.3% while rural unemployment is at 7.4% (LOC, 2008). These factors contribute indirectly to affordability and access to quality healthcare by the citizens.

Nigeria gained independence from the British in 1960 and it has suffered terrible military rule for almost 40 years. This has had a profound negative effect on the economy as well as its reputation, as it has been burdened with corruption, infrastructural negligence, religious conflicts and economic mismanagement. Transparency International Nigeria ranked 147 out of 179 countries in the 2007 Corruption perception index (LOC, 2008). This has directly affected many sectors of the economy especially the Health sector. At present, the total expenditure on health is 3.9% of the Gross Domestic Product (GDP). Despite the Federal Government's pledge to increase total annual budget on improving the healthcare systems in the country by 15%, only about 5% of this budget was allocated in the recent 2008 budget (CRR, 2008). Even when funds are granted by international organisations to meet Nigeria's pressing health needs, in some instances they are subsequently withdrawn due to the lack of transparency by the Government officials on how these funds were disbursed. An example was the suspension of a 50million US dollars grant in 2006 by the Global fund to prevent mother-to-child HIV transmission due to lack of transparency on the part of the Government (CRR, 2008). The life expectancy at birth is 48 years for men and 49 for women.

There are 36 states in the country with the capital being Abuja; with six main geo-political regions namely south-south, south-east, south-west, north-east, north-west and north-central regions. The states and regions in total are made up of 774 districts (ITU, 2005). The weather temperature ranges between 25 and 40 degrees centigrade. In 2000, the United Nations General Assembly, at the millennium summit which held in New York, adopted the Millennium declaration outlining new visions for the coming century which pledge to reduce globally child mortality and improve maternal health amongst other Millennium development goals (WHO, 2005). Since the declaration was put in place, Nigeria and many nations are yet to be on course towards attaining the set targets for improving maternal health and reducing child mortality (UNICEF, 2007). Even though there are effective interventions which can tackle this problem, they are not usually delivered to the populations that need them (low coverage); hence they persist. The inexistence of laws which would enable the probe of government officials due to inappropriate use of funds has only promoted the appalling nature of the healthcare system in the country (CRR, 2008). The public have little or no access to information regarding budget allocation to healthcare, as well as the utilization of these funds; hence these Government officials cannot be held accountable for their actions unlike in developed nations like the United Kingdom.

STUDY LOCATION

The study would be carried out in Bauchi state, located in the North-Eastern part of Nigeria. It is a religiously Islamic state, and its inhabitants are bound by the Sharia law. With an estimated total population of 4,706,909 and a total area of 45,837 square km, it prides itself as the 11th most populated state in Nigeria (Nigeria exchange, 2007). Based on the data provided by the National bureau of statistics, the female population of Bauchi state is 2,250,250 (NBS, 2006). Bauchi state was created in 1976 with its capital being Bauchi. A vast majority of the population actively participate in agriculture as sources of income. The state is also known for tourism as it is the location for the Yankari game reserve which is the biggest in West Africa, amongst other tourist attractions (Nigeria Galleria, 2004). The main language is Hausa with various tribes including the Fulanis, Jarawa, Waja, Tarewa, Sayawa, Tangale and Balewas (Nigeria Exchange, 2007). There are three senatorial districts in Bauchi, comprising of 20 local governments including Ganjuwa LGA which is the study location of interest. The estimated population of Ganjuwa LGA is 280,468 with a female population of 134,200 (NBS, 2006). This local government is just 17km from the state capital, but the shameful nature of infrastructural development especially in areas of healthcare service delivery should be a matter of utmost concern.

Bauchi state was pinpointed in this study due to the peculiarity about its healthcare services and cultural practices. The state is plagued with major reproductive health issues that contribute to its high maternal mortality rate of 1549/ 100,000 live births (above the national average) and an infant mortality rate of 79/1000 live births (COMPASS, 2007). Cultural and religious practices contribute to the preferences for the high fertility and polygamy profile in the state; its population growth rate is 3% (NDHS, 2004). The level of illiteracy in the state is high and a little fraction of the women attend schools. This directly affects their knowledge and awareness of antenatal care services, use of skilled attendants during/ after delivery; they also obtain very little information about caring for themselves and their unborn children. The acceptance and use of family planning services is extremely low based on their religious beliefs, with the contraceptive prevalence rate being 4% (far below the national prevalence average of 13%) (NDHS, 2004).

The tradition of early marriages is prevalent in Bauchi state as most men practice polygamy in accordance with the Islamic religious beliefs. We should note that Bauchi state still has the highest rate of teenage pregnancy and unsafe abortion in Nigeria (COMPASS, 2007). Prime reproductive health issues lacking in Bauchi state include the inability of those in need to access maternal/reproductive health services. Even when accessed, the deplorable state of these services is of great concern. Also, the unavailability of skilled health officials to attend to expectant mothers, and consistent emigration of suitably qualified health workers from this region due to poor financial motivation and living conditions have drastically affected maternal services in this state. Cultural factors like the prevalence of early/ forced marriages (where girls as young as 12 are forced into marriage with much older men), heinous traditional practices associated with female genital mutilation as well as the high fertility rates due to nonchalant attitude towards contraception all have negative impacts on maternal healthcare in Bauchi state (COMPASS, 2007).

The fertility rate tends to be higher in the North (as in Bauchi) than in the Southern parts of Nigeria; as well as in rural areas than in urban areas (NPC, 2004). Women in rural areas average have one more child (6.1 children) than their urban counterparts (5.9 children); this is usually attributed to their lower levels of educational attainment (NPC, 2004). It was also noted that 30% women in rural areas have early childbearing than those residing in urban areas with 17%, and this has an impact on their health outcomes (NPC, 2004). One in ten Nigerian women have to seek permission for medical treatment. The need to seek for their husband's consent prior to obtaining health services has significantly affected the use and rate of attendance of antenatal services amongst the affected women (NPC, 2004). The reproductive health needs of these women are usually seen as secondary to the men, even though they bear more risks in reality than their male counterparts. The varying economic, religious, gender, traditional and other existing barriers prevent the women from gaining access to proper medical care and services, leading to a resultant implication in the development and

management of pre-eclampsia amongst pregnant women in Bauchi, and Nigeria as a whole (COMPASS, 2007b). There is a wide disparity in employment levels in Bauchi as 19% of women are employed as compared to 87% of their male counterparts (UNFPA, 2003).

In summary, the Nigerian Demographic Health survey 2003 reveals that women in the Southern region (South-West/East) received better maternal care than women in the Northern region (North-East/West) expressing regional inequality (NDHS, 2004). Figures show that between 1-25% of women residing in the Southern region of Nigeria do not receive antenatal care; the figures are higher in the Northern regions with 47% women in the North-East and 59% in the North-west regions (NPC, 2004). Also those in rural areas were challenged, with regards to receiving quality healthcare in comparison to women residing in the urban areas. Hence the health inequality profile in Nigeria plays a pivotal role in maternal health service delivery across the country (NDHS, 2004). Inequality in education is also prominent as 42% of Nigerian women have never attended school before. Three-fifth of such uneducated women did not receive antenatal care from skilled personnel, compared to 70% of educated women. The survey also pinpointed that most Nigerian women perceived certain constraints to their using the healthcare system existed; 30% blamed it on getting finances for treatment from their spouses, 24% blamed it on distance and getting transportation to the health facility, 17% had issues about not meeting a female health provider (especially in the Northern Islamic areas like Bauchi), while 10% blamed it on spousal permission to go for medical care (NDHS, 2004).

APPENDIX 7

CLASSES OF PRE-ECLAMPSIA

FINDING	MILD PRE-ECLAMPSIA	SEVERE PRE-ECLAMPSIA
Diastolic blood pressure	Raised to 90-110mmHg on two occasions;1-4hours apart; > 20 weeks gestation	Raised to 110mmHg or more; > 20 weeks gestation.
Proteinuria	Up to 2+	3+ or more

OTHER POSSIBLE SIGNS DIFFERENTIATING PRE- AND SEVERE ECLAMPSIA

FINDING	MILD PRE-ECLAMPSIA	SEVERE PRE-ECLAMPSIA
Headache	Absent	Sometimes present
Upper epigastric pain	Absent	Sometimes present
Oliguria (< 400ml/24 hours)	No Oliguria	Diminished urinary output (> 400ml/ 24hours)
Visual disturbances	Absent	Sometimes present
Hyper-reflexia	Absent	Sometimes present
Pulmonary oedema	Absent	Sometimes present

Source: World Health Organization (2006) *Managing Eclampsia.* (Accessed 15 July 2008)

APPENDIX 8

STAGES OF ECLAMPTIC FITS

Premonitary stage	Lasts 10-20 seconds Muscles of face and hand may twitch Eyes usually roll or stare
Tonic stage	lasts up to 30seconds Violent spasms in muscles Clenched fists, rigid arms/ legs Spasm in diaphragm; breathing stops; cyanosis Teeth are clenched Eyes usually bulge
Clonic stage	Lasts 1-2 minutes Violent contraction/ relaxation of muscles Increased salivation; foaming at the mouth Deep crackling breathing observed Face is swollen, congested with blood
Coma stage	Lasts minutes to hours Patient deeply unconscious Noisily breathing occurs Cyanosis (blue skin) fades away Face may still remain congested with blood Possibility of further occurring fits Possible death

It is important to note that the pregnant patient may be unconscious and die just after only one or two eclamptic fits, depending on the circumstances and proper care must be taken to prevent these fits from occurring in the first place, or even to manage them effectively when they occur.

Source: World Health Organization (2006) *Managing Eclampsia.* (Accessed 17 July 2008)

APPENDIX 9

WHO antenatal care basic component checklist, designed as a standard tool which ensures all women receive quality care during antenatal visits.

Name of patient _____ Address & telephone No. _____

_____

Clinic record No. _____

FIRST VISIT *for all women at first contact with clinics, regardless of gestational age. If first visit later than recommended, carry out all activities up to that time* DATE: / /	Visits			
	1st <12 wks	2nd	3rd	4th
Classifying form which indicates eligibility for the basic component of the programme				
Clinical examination				
Clinically severe anaemia? Hb test				
Ob. exam: gestational age estimation, uterine height				
Gyn. exam (can be postponed until second visit)				
Blood pressure taken				
Maternal weight / height				
Rapid syphilis test performed, detection of symptomatic STIs				
Urine test (multiple dipstick) performed				
Blood type and Rh requested				
Tetanus toxoid given				
Fe / Folic acid supplementation provided				
Recommendation for emergencies / hotline for emergencies				

Complete antenatal card				
SECOND VISIT and SUBSEQUENT VISITS *Gestational age – approx. # of weeks* DATE: / / 26wks 32wks 38wks				
Clinical examination for anaemia				
Ob. exam: gestational age estimation, uterine height, fetal heart rate				
Blood pressure taken				
Maternal weight (only women with low weight at first visit)				
Urine test for protein (only nulliparous women / women with previous pre-eclampsia)				
Fe / Folic acid supplementation given				
Recommendation for emergencies				
Complete antenatal card				
THIRD VISIT: add to second visit DATE: / /				
Haemoglobin test requested				
Tetanus toxoid (second dose)				
Instructions for delivery/plan for birth				
Recommendations for lactation / contraception				
FOURTH VISIT: add to second and third visits DATE: / /				

Detection of breech presentation and referral for external cephalic version				
Complete ANC card, recommend that it be brought to hospital				

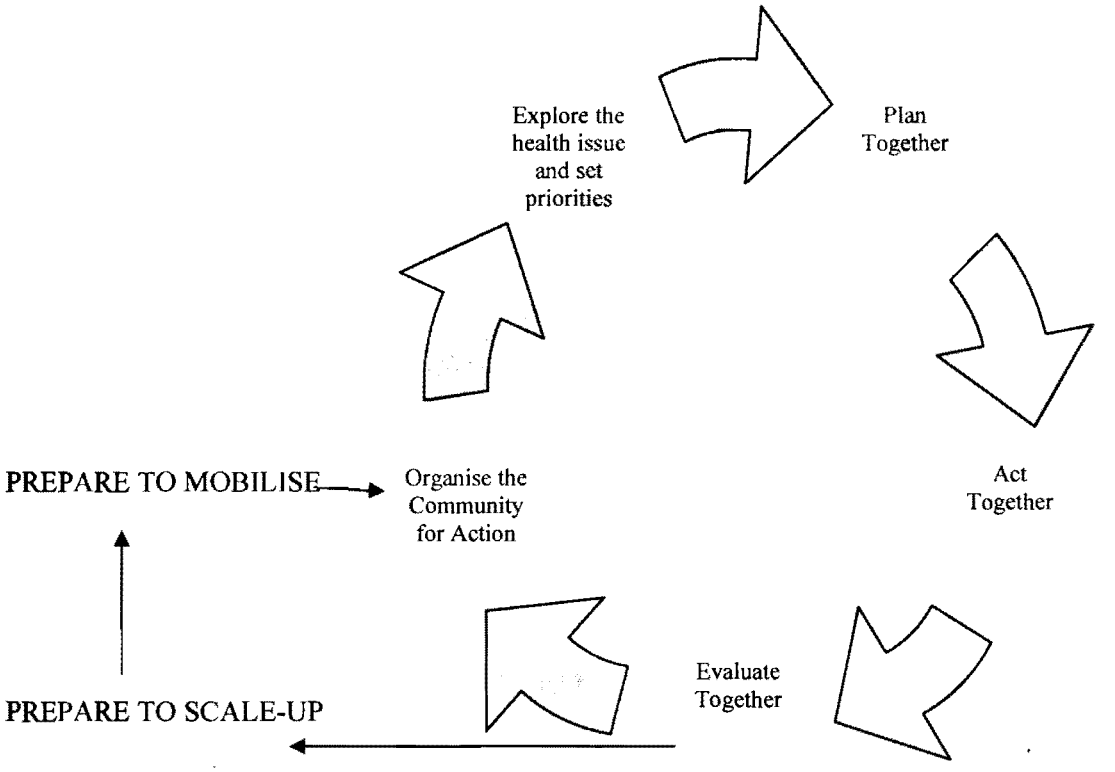
Staff responsible for antenatal care: Name _____

Signature _____

Source: WHO (2008d) WHO antenatal care randomised trials. Available at: http://www.who.int/reproductivehealth/publications/RHR_01_30/RHR_01_30_chap4.en.html

APPENDIX 10

COMMUNITY ACTION CYCLE THROUGH WHICH COMMUNITY MOBILIZATION CAN BE CO-ORDINATED IN A PARTICULAR LOCATION.



SOURCE: USAID (2008). Available at:
http://accesstohealth.net/about/pgmnews/presentations/20080600a_eotolorinPPTng.pdf

APPENDIX 11

The Letter of Ethical Approval from the National health research Ethics Committee in Nigeria, prior to concluding the study.

National Health Research Ethics Committee, Nigeria

Promoting Highest Ethical and Scientific Standards for Health Research in Nigeria

NHREC Protocol Number: NHREC/01/01/2007-17/06/2008
NHREC approval Number: NHREC/01/01/2007-30/06/2008

Re: Community Awareness in Managing Pre-Eclampsia in Nigeria

Health Research Committee assigned number: NHREC/01/01/2007
Name of Principal Investigator: Pharm. Dennis Kanu Otis
Address of Principal Investigator: University of Bedfordshire, Luton, UK, Luton, LU1 3JU, UK
Date of receipt of valid application: 17-06-2008
Date of meeting when final determination of research was made: 30-06-2008

Notice of Expedited Review and Approval

This is to inform you that the research described in the submitted protocol, the consent forms, advertisements and other participant information materials have been reviewed and *given expedited approval by the Health Research Ethics Committee*

This approval dates from 30/06/2008 30/06/2009. If there is delay in starting the research, please inform the HREC so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study.* In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification.

Signed

Professor Clement Adebamowo *BAO,bB Hons,Dos, FWACS, FACS, DSc (Harvard)*
Chairman

APPENDIX 12

QUESTIONNAIRES USED IN THE STUDY

FIRST SET

COMMUNITY AWARENESS IN RURAL NIGERIA ON MANAGING PRE-ECLAMPSIA IN WOMEN ESPECIALLY FIRST TIME MOTHERS

Health questionnaire addressed to pregnant women (including first time and other mothers) to evaluate their awareness on the issue of pre-eclampsia.

Section 1 – Personal details

1. Age group 15-24 [1] 25-34 [2] 35-44 [3] 45-54 [4]

2. Occupation _____

3. What is the highest level of schooling you have completed?
Uneducated [U] Primary school [P] Secondary school [S]
College or University [C]

Section 2 – Health evaluation and awareness section
(Please tick in the box)

4) Is this your first pregnancy Yes [Y] No [N]
If No, how many times have you been pregnant?
Once [1] Twice [2] Thrice [3] 4 times or more [4]

5) Are you registered to attend antenatal services? Yes [Y] No [N]

6) Do you know what the antenatal services are? Yes [Y] No [N].

Does it involve?
(i) Examining the mother [M]

(ii) Examining the baby [B]

(iii) Examine the husband [H]

(iv) Examining the hospital [S]

(v) None of the above [N]

7) How many times have you attended these antenatal services?

Never [0] Once [1] 2 times [2] 3 times [3] 4 times or more [4]

8) What services did the health staff provide you during such visits?

(i) Did they check your blood pressure [BP]

(ii) Did they check your blood sugar [BS]

(iii) Did they perform ultrasound-scanning on you [US]

(iv) Did you have a urine test to monitor urine-protein levels [UP]

(v) Did they offer health information services to you [I]

9) Have you ever heard about pre-eclampsia?

Never [1] Yes but I don't know what it is [2] Yes [3]

If yes, what do you think it is?

.....

.....

.....

10) What do you think are the symptoms for pre-eclampsia?

Headache [H] Swollen feet [SF] Lower abdominal pain [LA] Increased weight gain [WG] High blood pressure during pregnancy [HP]

11) Has anyone around you had previous experience of pre-eclampsia?

Nobody [N] My mother [M] My sister [S] My neighbour [NE] My friend [F]

12) From where do you obtain information about pre-eclampsia?

(i) From your doctor [D]

(ii) From your nurse/midwife [N]

(iii) Your healthcare assistant [H]

(v) From the media (Radio/TV/Newspaper) [M]

13) From which services would you prefer to get further information about pre-eclampsia and other health related advice?

(i) From the doctor [Doc]

(ii) From the nurse [Nurse]

(iii) From your husband/family member [Family]

(iv) Religious leader [Leader]

(v) From media (Radio/TV/Newspaper) [Media]

14) Do you believe that such information can prevent you and other women from developing pre-eclampsia? Yes [Y] No [N].

If yes, please tell us why

.....

.....

.....

.....

15) Are you satisfied with the health care services in your community?

Yes [Y] No [N] Undecided [U]

16) Do you think your health and that of other women will improve if better medical, health and financial services will be provided in order to create awareness on the issue of pre-eclampsia in your community?

Yes [Y] No [N] I have no opinion [U]

If yes, what do you think would be useful to the women?

.....

.....

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SECOND SET

COMMUNITY AWARENESS ON MANAGING PRE-ECLAMPSIA IN WOMEN ESPECIALLY FIRST TIME MOTHERS IN BAUCHI, NIGERIA

Health questionnaires addressed to health professionals in Nigeria
(*Medical doctors and consultants, Community and specialised nurses, hospital maternity ward assistants, health care assistants*)

Section 1 – Personal details

1. Sex Male [M] Female [F]

2. Age group 15-24 [1] 25-34 [2] 35-44 [3] 45 and above [4]

3. Occupation _____

4. Level of educational attainment
Primary school [P] Secondary school [S] Vocational Training [V] College or University [C]

Section 2 – Health Evaluation and Knowledge on Pre-eclampsia
(Please tick in the box)

5) Do you know what pre-eclampsia is?
(i) Male disorder [Male]
(ii) Mental disorder [Mental]
(iii) Orthopaedic disorder [Ortho]
(iv) Childhood disorder [Child]
(v) Hypertension in pregnancy [Hyper]

6) When did you first hear/learn about pre-eclampsia?
(i) At school [School]
(ii) At work [Work]
(iii) In a book or journal [Book]
(iv) Media (Radio/TV/Newspaper) [Media]

(v) Happened to someone I know [Someone]

(vi) Other [Other] Please specify.....

7) Is pre-eclampsia a fatal disease?

(i) Never [N] (ii) Sometimes [S] (iii) Always [A] (iv) I don't know [D]

8) Is pre-eclampsia a communicable disease which can affect other women on contact with the affected woman?

(i) Yes [Y] (ii) No [N] (iii) I don't know [D]

9) In what trimester of pregnancy does it occur?

(i) During the first [1st] (ii) During the second trimester [2nd]

(iii) During the third trimester of pregnancy [3rd] (iv) None of them [None]

(v) In all trimesters [All]

10) Does a pregnant woman's feeding habits pre-dispose her to getting pre-eclampsia? (i) Yes [Y]

(ii) No [N] (iii) I don't know [D]

11) What symptoms would a pre-eclamptic woman present?

(i) Swelling in stomach [1]

(ii) Swelling in feet and legs [2]

(iii) High blood pressure in pregnancy [3]

(iv) Low blood pressure during pregnancy [4]

(v) Low protein levels in urine during pregnancy [5]

(vi) Increased body weight of >2Kg/week [6]

12) What are the clinical signs for deducing if a pregnant woman has pre-eclampsia?

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13) How can we determine if a patient has pre-eclampsia?

(i) Increased protein in the urine [Protein]

(ii) High blood pressure in pregnancy [HBP]

(iii) Decreased weight gain of 2Kg/week [Weight]

(iv) Knee pains [Knee]

(v) Breathing difficulties [Breathing]

14) How many times in a year do you come across a patient who suffers from pre-eclampsia?

Never [0] 1-4 times [1] 5-10 times [2] 11-20 times [3] 21 times or more [4]

15) How many people do you know that have suffered from pre-eclampsia?

None [0] 1-4 [1] 5-9 [2] 10-14 [3] >14 [4]

16) Do you know a remedy for managing pre-eclampsia?

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17) Can pre-eclampsia lead to eclampsia?

(i) Never [N] (ii) Sometimes [S] (iii) Always [A] (iv) I don't know [D]

18) How can you prevent a pregnant woman from developing full eclampsia?

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19) Do you think healthcare staffs need further standard training on the management of pre-eclampsia?

(i) Yes [Y] (ii) No [N] (iii) I don't know [D]

APPENDIX 13

LETTER SEEKING INFORMED CONSENT AND PARTICIPATION FROM RESPONDENTS

CONSENT FORM

My name is Denis Otis Kanu. I am a Masters student currently enrolled in the Public Health module at the University of Bedfordshire, Park square Campus, Luton, United Kingdom. The proposed study is entitled: *Community awareness in managing pre-eclampsia in Bauchi state, Nigeria: A cross-sectional study.*

This study seeks to explore implicitly the level of awareness amongst community women of the presentation and basic symptoms of pre-eclampsia, and its effect in pregnancy related injuries for both pregnant mothers and fellow healthcare workers. The use of antenatal care services would also be reviewed. This study employs a cross-sectional study design which would be undertaken in the study population located in North-East, Nigeria.

The objectives of this study cuts across determining if the level of awareness in a community on the presentation of pre-eclamptic symptoms can prevent clinical complications which result in morbidity and/ or deaths amongst women, especially those with limited access to standard healthcare facilities. It also looks at the critical knowledge of community healthcare workers in managing patients who present with pre-eclampsia, especially first-time mothers.

The design of the study would use both questionnaires and semi-structured interviews to obtain both qualitative and quantitative data. Sets of pre-coded questionnaires (15-20 questions) would be distributed to the participants. Data will also be obtained from field observation, Hospital medical records and the State Ministry of Health and analyzed for possible co-relation with the research's aims and objectives.

PARTICIPANT

I have read and understood the information sheet and the aims of the research, and I confirm that I understand that all the information I give will be treated with the highest level of anonymity and confidentiality to protect my identity. I also understand that I can withdraw fully from the research study at any time without being prejudiced in any way. I consent willingly to the researcher using all the information I provide to carry out the research and publish its results.

I agree to take part in the study:

Signature..... Date.....

Witness..... Date.....

Researcher's signature..... Date.....

APPENDIX 14

PARTICIPANT INFORMATION SHEET

Research Topic: Community awareness in managing pre-eclampsia in Bauchi state, Nigeria: A cross-sectional study.

You are kindly invited to take part in a research study which is designed to explore implicitly the awareness of a community in Northern Nigeria towards managing pre-eclampsia amongst women. Simple questions will be asked during the interview; they would be recorded and noted as a method of data collection. This interview would be carried out in a convenient place where pressing issues would be openly discussed and clarified for your greater understanding and improved participation. All information is kept in strict confidence, and it is only the researcher who will have access to the information, as the notes would be securely stored.

You are free to withdraw from the study at anytime you so wish. Should in case there are certain issues regarding the research study which you find hard to comprehend and require further clarification, kindly feel free to consult the researcher. It is highly important that you recognise that information you provide towards this research study during the interview would be used to design and most likely, implement strategies which would help improve awareness and increase communal participation towards managing the dilemma of pre-eclampsia amongst women in our society, thus mitigating maternal morbidity and mortality from this health condition in the long run.

If you have read carefully all the issues concerning this research study and feel satisfied to partake in the study, kindly print your name and sign below in the spaces provided. Further information regarding this research study can be obtained by contacting Denis Kanu on telephone: +447902780928; +2348036046126.
email: denis.kanu@hotmail.co.uk . Thank you.

I.....have read and understood all the information about the conduct of the research study and I am satisfied to further partake in this study.

APPENDIX 15

QUESTIONNAIRE BASED INTERVIEW GUIDE

a) Knowledge of pre-eclampsia

- What do you consider pre-eclampsia to be?
- How do you think pre-eclampsia can be managed in your community?
- What do you think are barriers to effectively managing pre-eclampsia in your community?

b) Prevention of pre-eclampsia

- What factors do you believe could be useful in preventing pre-eclampsia at community levels?

c) Relevance of Antenatal care services

- Do you think Antenatal care services are relevant in preventing pregnancy-induced complications amongst community women?
- What actually happens during antenatal care visits in your community?
- Do you consider Antenatal care as being effectively used in your community?
- What do you feel about the quality of antenatal care being offered to community women?

d) Future of Antenatal care in preventing pre-eclampsia

- How do you think we could improve the future of Antenatal care in your community so as to reduce maternal mortality amongst Nigerian women?
- Do you feel local participation of community members could improve awareness and advocacy of pre-eclampsia at grassroots levels?

APPENDIX 16

Other Approval Letters
(see in submitted hard copy)